

## The automotive industry and formaldehyde

Cars have become one of the most important means of private transport in the modern world and an essential part of the European economy. With almost every second person in the EU owning a car, the importance of private transport to the independent western life style is evident.

A lot of research is being undertaken to increase the comfort and safety of cars to a maximum whilst keeping their impact on the environment to a minimum. Cars also have to comply with the constantly developing aesthetic demands of consumers. To be able to satisfy design trends and, at the same time, ensure the highest possible safety, car materials have to possess a variety of characteristics. They have to be flexible enough to be formed into complicated shapes, resilient enough to survive extreme environments and strong and tough in order to endure impacts.

With the help of formaldehyde it is possible to create a material that can meet all these challenges: Polyoxymethylene (POM), a type of plastic that is derived from formaldehyde and is used widely in the car industry.

### POM - a material of choice!

As plastic does not corrode and has a high shock absorption it is an excellent material for the car industry. In addition, the weight loss that is achieved through replacing metal with plastics results in lower fuel consumption. Replacing traditional materials with plastics has brought down the weight of current cars



by approximately 200 kg (17%) and has cut fuel consumption by approximately 750 litres (6%) over a life span of 150 000 km.

However, the qualities of plastics differ widely and many specific needs of the automobile industry can only be met by POM. This thermoplastic is an exceptional material that can be easily shaped into complex forms for car interiors and exteriors. Yet it is dimensionally stable and durable throughout time.

Around 3000 different formaldehyde-derived thermoplastic components are used in modern cars. To manufacture a car to current safety, quality and design

### Examples of the use of POM in cars

Speaker grills

Fuel systems, valves, filters & pump components

Mirrors

Window winders

Door module & handles

Gears

Heater / air conditioning

Sun roof system

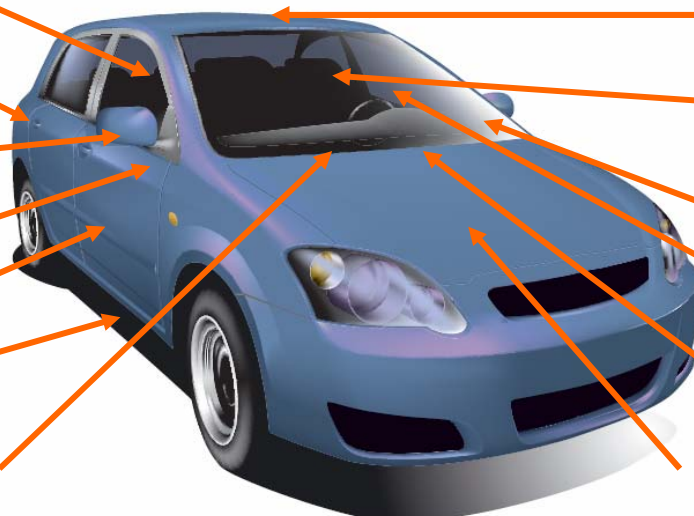
Seating parts & system

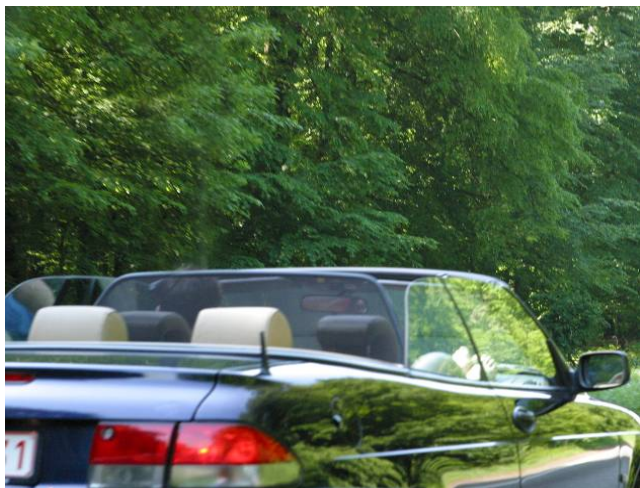
Door lock systems

Safety buckles & belt system

Windshield wipers

Auto electrical systems





standards without POM would therefore be practically impossible. Two examples of how POM is used to build safer and more efficient cars are the development of safety belt systems and fuel pumps.

### Secure with the right material

To ensure lasting safety, seatbelt buckles and systems have to maintain their quality for the lifetime of a car. They have to perform in both extremely high and low temperatures and have to be able to withstand the immediate impact of a possible accident. As POM is strong and insensitive to extreme temperatures and allows the formation of complicated shapes it is the best material to model complex seatbelt systems with lasting quality. Nearly 8000 lives have been saved in Great Britain since 1983 when legislation first enforced the use of seatbelts.

### Fuel systems that last

Fuel pumps and filters need to be resistant to petrol. This is especially true for those fuel pumps that are inserted straight into the tank which increases efficiency but exposes them directly to the fuel. POM's high resistance to chemicals and fuel therefore makes it a perfect material to be used in fuel systems, pumps and filters.

Safety belts and fuel pumps are only two examples of the great variety of applications in a car that are made of POM. 50 years ago, cars were still a luxury and the safety of passengers in an accident was close to nil. It is, among others, thanks to formaldehyde that it is now possible to produce materials which allow us to manufacture safer cars at affordable prices.

### What is POM?

Polyoxymethylene (POM) is a type of plastic that is derived from formaldehyde and widely used in industry, agriculture, transport, construction, consumer goods, sanitary applications and medical applications. Plastics like POM have many advantages over metal. Not only are they recyclable, durable and anti-static, but also lighter, functional and flexible; they do not corrode and allow efficient processing with the possibility to easily add new features. It is due to these superior properties that POM has replaced metal in a lot of applications and has gained a high commercial importance during the last 45 years.

### Main application areas of POM

- Industrial and construction applications (machineries, pumps, gears, hardware, vehicles, exterior building blinds)
- Consumer articles (cars, watches, mixers, blenders, water softener, shower heads, kitchen appliances, cloth washers and dryers, dishwashers, computers, printer)
- Sports articles (sailboats and sailboards, roller breaks, skiing equipment)
- Medical appliances (e.g. drug delivery devices such as inhalers)

### Key benefits of POM

- High strength
- High resilience
- Fatigue resistance / good long term property
- Resistance to chemicals (i.e. solvents) and water
- High wear resistance and abrasion resistance
- Good performance in high and low temperature
- Recyclable

**Disclaimer:** The content of this fact-sheet is based on simplified scientific information and it is not claimed to be exhaustive. FormaCare has compiled this information very carefully and offers it in utmost good faith. This information is believed to be correct. Nevertheless, FormaCare makes no representations or warranties as to the completeness or accuracy of any of this information. FormaCare will in no event be responsible for damages of any nature whatsoever resulting from the use or reliance to the information contained in this Fact sheet.

### About FormaCare

As a sector group of Cefic (the European Chemical Industry Council), FormaCare represents key European producers of formaldehyde, aminoplast glues and polyols. FormaCare aims to promote the sustainable use of formaldehyde and formaldehyde-based products among its members and their customers, with due regard to health and environmental care.

### Contact us

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