The International Bromine Council

www.bsef.org

The unique physical and chemical properties of Bromobutyl Rubber

Products made from rubber are a vital part of everyday living. In homes, hospitals, hotels, offices, laboratories, construction and production facilities, rubber is everywhere and serves all kinds of industries where products could not function without rubber components.

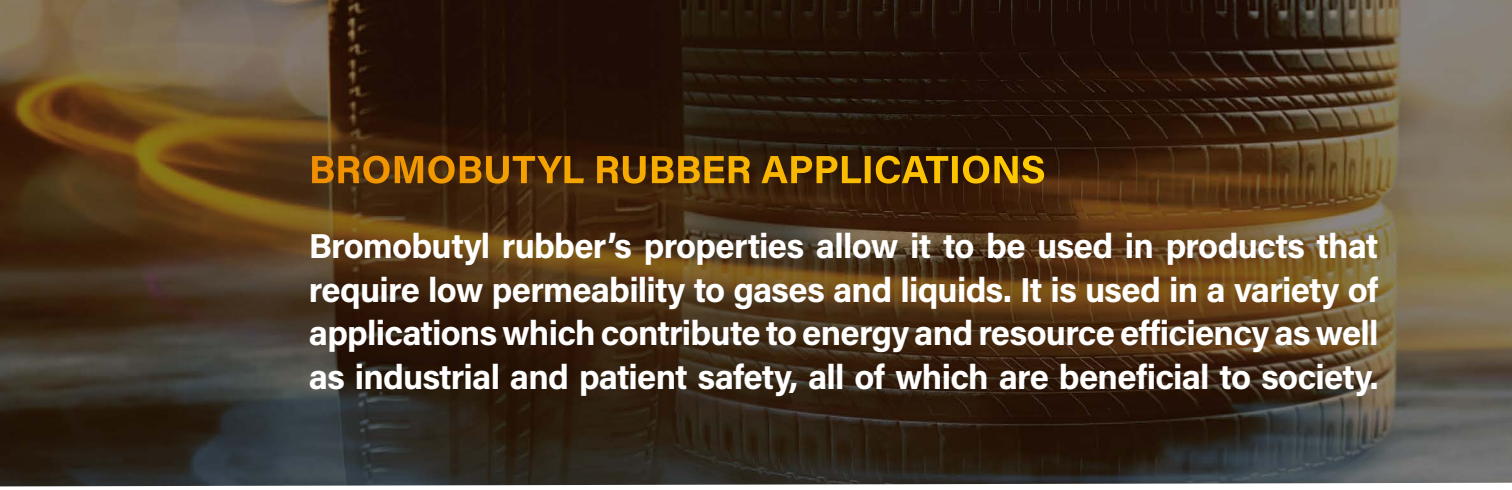
For example, the automotive sector accounts for 65% of rubber production, with parts and components such as windscreen wipers, engine mountings, window seals, tyres, etc.[1]

Bromobutyl rubber is derived from combining butyl rubber with bromine. Developed in the 1940s, the addition of bromine to butyl rubber gives considerable added value to the product. Most commonly used in the automotive industry, butyl rubber has considerable physical strength, low permeability, and is highly shock, weather and age resistant.

Besides the attributes associated with butyl rubber, bromobutyl rubber possesses other fundamental advantages including stability at high temperatures, rejuvenating capabilities, stronger resistance, increased adhesion to other rubbers and metals, and lastly, improved ozone and environmental resistance.[2]

"Butyl Rubber extends a tyre's life, reduces fuel consumption and thus also minimizes C02 emissions."

[1] http://www.etrma.org/ ETRMA, European Tyre and Rubber Manufacturers' Association
[2] https://www.jameswalker.biz/de/pdf_docs/148-elastomer-engineering-guide



BROMOBUTYL RUBBER APPLICATIONS

Bromobutyl rubber's properties allow it to be used in products that require low permeability to gases and liquids. It is used in a variety of applications which contribute to energy and resource efficiency as well as industrial and patient safety, all of which are beneficial to society.

TYRES

According to the European Automobile Manufactures Association (ACEA) there are some 308.3 million vehicles on Europe's roads, more than one for every two people.[3] When it comes to road safety, tyres are one of the most important components of the vehicles.

In comparison to older tyres, modern radial tyres contain bromobutyl rubber that is found in the inner lining. This inner lining is used to contain and maintain air in the tyres. Benefits from using bromobutyl rubber include the tyre's ability to self-seal with respect to small puncture holes, and improve its air retention performance and therefore the tyre's durability.

The bromobutyl rubber in the inner lining provides a barrier that prevents air from entering the tyre's structure and degrading its rubber, thereby improving air retention. Due to its polymer structure, a 100% bromobutyl polymer tyre provides the lowest air permeability rate. Ultimately, this ensures that the product life cycle of the tyre is longer and contributes to the safety of motorists by avoiding tyre failure. An increase in a tyre's longevity, requiring less tyre replacements also has an overall positive impact on the environment, resource use and energy use (through the avoided CO2 emissions).

Fuel-efficient tyres - if widely used - could save an estimated 6.6 Mtoe (million tonnes of oil equivalent) of fuel per year by 2020. They could also cut CO2 emissions by 4 million tonnes a year, the equivalent of removing 1.3 million passenger cars from EU roads annually.[4] In this way bromobutyl rubber contributes to sustainable mobility and the EU climate change goals.

[3] https://www.acea.be/statistics
[4] https://ec.europa.eu/transport/road_safety/home_en

MEDICAL STOPPERS AND MEMBRANES

Due to their sealing abilities, bromobutyl rubber stoppers are used for sealing medicine vials and bottles in hospitals and laboratories for the safe and effective storage and application of drugs and for scientific research.

It has been established that pharmaceutical packaging material is critical to the stability of a drug, because the packaging materials can directly influence the clinical curative effect of the pharmaceuticals.[5]

Bromobutyl rubber has several properties that make it applicable for medical and scientific uses; for example, it is chemically inert, nonpolar and contains a low level of extractable impurities that could contaminate the drug over time.[6]

Another important property is that the rubber's membrane rejuvenates when pierced with a needle. This process can be repeated several times, so that the stopper does not need to be changed after each use.

"Bromobutyl rubber has several properties that make it applicable for medical and scientific uses."

[5] https://www.sciencedirect.com/science/article/pii/S2095177918303769
[6] https://www.exxonmobilchemical.com/Chem-English/yourindustry/butyl-rubber-applications-healthcare.aspx

CONVEYOR BELTS

Heat resistant conveyor belts used in cement plants, foundries, heating and power stations, experience temperatures that can reach up to 400°C. In order to tolerate such extreme temperatures, conveyor belts made of bromobutyl rubber have been developed and refined over years.

The excellent heat and chemical stability of butyl rubber makes it ideal for specialty conveyor belt applications.

The conveyor belts are covered in bromobutyl rubber that acts as a barrier to the source of heat. Apart from ensuring that the extreme conditions can be sustained, the cover also contributes to a longer operational lifespan as it protects the belt itself from the heat.

WINDSCREEN WIPERS

Properly functioning wiper blades are very important for the driving experience and overall safety. Properties such as resistance to weather and temperature changes, make bromobutyl rubber appropriate for use in windscreen wipers as it adds to their durability.

ABOUT BROMINE

Bromine's symbol is Br. It is part of the halogen group of the periodic table. Bromine is a reddish brown liquid. It is never naturally found in its elemental form but in inorganic compounds, known also as bromides, and in natural bromo-organic compounds. These are found in soils, salts, air and sea water.

ABOUT BSEF

BSEF – the International Bromine Council, represents the major global bromine producers. Since 1997, the organisation has been working to foster knowledge on the uses and benefits of bromine-based solutions. BSEF strongly believes in science and innovation. Through investments in research and development BSEF members create robust bromine-based technologies meeting the needs of society.

OUR MEMBERS

BSEF champions bromine's many benefits around the world. Bromine-based solutions are essential to many of the most important advancements in science and technology. The members of BSEF are Lanxess, Albermarle Corporation, Tosoh Corporation. and ICL Industrial Products.

LANXESS Energizing Chemistry

ALBEMARLE®

TOSOH

ICL Industrial Products Where needs take us

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