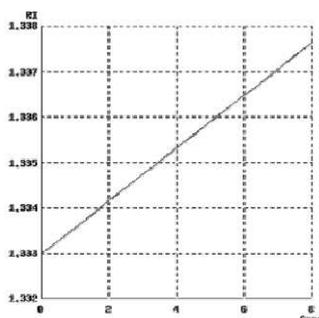


NITRILE BUTADIENE RUBBER (NBR), SYNTHETIC LATEX

Typical end products

Synthetic latex, synthetic rubber and automotive products, roll covers, hydraulic hoses, conveyor belts, oil field packers, seals

Chemical curve: Nitrile butadiene R.I. per Conc% b.w. at Ref. Temp. of 20°C



Introduction

Nitrile Butadiene Rubber (NBR) is commonly considered to be the keystone for industrial and automotive rubber products, such as synthetic latex. Actually, NBR is a complex family of unsaturated acrylonitrile and butadiene copolymers. By selecting an elastomer with the appropriate acrylonitrile content in balance with other properties, the rubber compounder can use NBR for a wide variety of applications requiring oil, fuel and chemical resistance. The uses for NBR in the automotive

industry include fuel and oil hoses, seals and grommets, and water handling applications.

Application

NBR is produced in an emulsion polymerization system. The water, emulsifier/soap, monomers (butadiene and acrylonitrile), radical generating activator, and other ingredients are introduced into the polymerization vessels. The emulsion process yields a polymer latex, which is coagulated using various materials (e.g. calcium chloride, aluminum sulfate) to form crumb rubber, which is dried and compressed into bales. Some specialty products are packaged in the crumb form.

NBR producers vary polymerization temperatures to make "hot" and "cold" polymers. Acrylonitrile (ACN) and butadiene (BD) ratios are varied for specific oil and fuel resistance and low temperature requirements. Speciality NBR polymers containing a third monomer (e.g. divinyl benzene, methacrylic acid) are also offered. Some NBR elastomers are hydrogenated to reduce the chemical reactivity of the polymer chain, significantly improving heat resistance. Each modification contributes to uniquely different properties.

Installation

The K-Patents Process Refractometer PR-23-GP is installed in the polymerization vessel to accurately and reliably determine the degree, and the end point of the polymerization. The refractometer output signal indicates the degree of polymerization. The information is based on the conversion rate from monomer to polymer. This is determined by the relationship between conversion and the component solids% involved. Each individual polymerization

vessel requires the installation of a refractometer to accurately monitor the conversion rate.

Appropriate equipment with hazardous and intrinsic safety approvals are available when required. Automatic prism wash with high pressure water is recommended.

Instrumentation	Description
	K-Patents Process Refractometer PR-23-GP is an industrial refractometer for large pipe sizes and tanks, cookers, crystallizers and kettles. Installation through a flange or clamp connection.
Automatic prism wash:	Prism wash with high pressure water: The components of a high pressure water system are a sensor with integral water nozzle mounted at the sensor head, a high pressure pump together with a power relay unit and an indicating transmitter equipped with relays.
Area classification:	Intrinsic safety and hazardous area approvals available.
Measurement range:	Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 % by weight.