

General information

Overview

The leading non-tire synthetic rubber. Like NR, CR is capable of strain-induced crystallization resulting in superior mechanical properties.

Strengths

Mechanical properties and fatigue resistance second only to natural rubber (NR). Superior to NR in its chemical, oil, and heat resistance, and lower gas permeability. Good ozone resistance compared to other diene-based 'R' rubbers. Good metal bonding. Fire resistance. Can be produced in almost any color.

Limitations

Less resistant to low temperature stiffening than NR (compounding can improve this), poorer set and creep than NR. Relatively high water adsorption.

Designation

Polychloroprene, Polychlorobutadiene, Chloroprene rubber (CR)

Tradenames

Neoprene, Baypren, Denka Chloroprene, Butaclor, Skyprene

Typical uses

Wire and cable coating, hose, automotive timing belts, brake seals, diaphragms, tracked-vehicle pads, wet suit sponge, soles and heels, rubber coating for fabrics, roof coatings. Also, adhesives - pre-eminent among elastomeric adhesives due to combination of polarity and strength.

Composition overview

Compositional summary

Poly-chloroprene (mainly trans isomer), chemical formula: $(CH_2-CCl=CH-CH_2)_n$. 40% Cl. Typically cured by metal oxides (MgO & ZnO at ~5phr).

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|-----------------|-------------------------------|
| Material family | Elastomer (thermoset, rubber) |
| Base material | CR (Chloroprene rubber) |

Processing properties

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| First commercial production | 1931 |
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Forming

Suitable for extrusion, calendering, compression, transfer, and injection molding. For ease of processing plasticizers (e.g. aromatic or naphthenic oils) are often added as 10-20 wt% of the filler. Higher filler content grades are easier to extrude.

Notes

Warning

CR rubbers present no known health hazards apart from one grade, DuPont's Neoprene FB, which can cause skin irritation. Polychloroprene latexes are strongly alkaline and so can cause severe skin irritation and eye damage. Decomposition during processing can release HCl and other toxic or irritating vapors.