

Foundation

1984

Turnover

Privately held

Employees

>200

Locations

- Offices and sales representation in the Americas, Europe, Asia
- Manufacturing facilities in Zhuhai, China, and Mangalore, India

Branches

- Specialty Materials
- Polymer Building Blocks

Key materials

- Epoxy Curing Agents
- Epoxy Resins, Diluents and Modifiers
- CNSL-based Resins
- Hydrocarbon Resins
- Friction Particles and Resins
- Polyols and Diols
- NCO Blocking Agents
- CNSL-based Intermediates



Company

Cardolite is the world's largest producer and developer of specialty chemical products originating from Cashew NutShell Liquid (CNSL). CNSL is a renewable chemical that does not interfere with the food chain and has a unique structure suitable for use as a building block of advanced materials.

Cardolite CNSL derivatives such as specialty epoxy curing agents, and various types of epoxy, phenolic and polyol resins and modifiers bring performance benefits to the coatings, adhesives, composites, foams and friction industries worldwide. With a heavy emphasis on research and development, Cardolite continually invests in the development of innovative materials that can improve today's products in a sustainable manner.

Cashew Nut Shell Technology (CNSL)

Cardolite products are based on cashew nutshell liquid, a natural, nonfood chain, and annually renewable biomaterial. CNSL is a reddish brown viscous liquid extracted from a soft honeycomb structure inside the cashew nutshell.

This nutshell liquid contains mainly anacardic acid and a smaller amount of cardol and its methyl derivatives. CNSL can be decarboxylated and distilled to yield high purity cardanol, a highly desirable alkylphenolic compound that can be functionalized in various ways. The distillation residue can be used to produce resilient friction particles and binders for the automotive brake lining industry.

Cardanol is used as a primary building block for Cardolite epoxy curing agents and epoxy and polyols diluents and modifiers. This natural alkylphenolic material has an aromatic ring that provides a strong chemical resistant backbone while the hydroxyl group gives strong adhesion and good reactivity for fast and low temperature cure. A long aliphatic side chain provides excellent water resistance, good flexibility, low viscosity, extended pot life, and excellent corrosion protection.



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Products

Cardolite CNSL derivatives are typically high in bio-content and used in coatings, adhesives, composites, polyurethane foams and friction materials to deliver high performance and unique properties to formulators and end-users.

Epoxy Curing Agents

Cardolite phenalkamines provide very fast cure even below zero temperatures, and excellent adhesion and corrosion protection to unprepared and immersed surfaces. Cardolite phenalkamides deliver some of the advantages of phenalkamines, but with longer pot life, better flexibility and UV resistance, and extended overcoat window.

Epoxy Resins and Modifiers

Cardolite resin and modifier portfolio is comprised of reactive and nonreactive epoxy diluents and multi-purpose modifiers that not only lower viscosity to enable low VOC epoxy systems, but also improve anticorrosion properties, flexibility, and early water resistance. In addition, a difunctional glycidyl ether resin and a polyglycidyl ether epoxy novolac are offered to formulators that need to increase flexibility of the system without compromising other properties.

Polyols, Diols and NCO Blocking Agents

Cardolite offers multiple renewable solutions for polyurethane formulators. CNSL-based polyols have unique qualities compared to widely known polyester and polyether polyols, and other natural oil based polyols. They are very hydrophobic because of the long aliphatic chain of cardanol, which results in excellent water resistance and less moisture sensitivity during cure with isocyanate for increased durability of the final polyurethane system.

CNSL-based diols combine the benefits of CNSL and polyester technologies resulting in excellent solvent, alkaline, acid, and water resistance, and good dimensional stability. They can be formulated as binders or as a building block for prepolymers. Moreover, Cardolite's very high purity cardanol developed via a proprietary process technology is an excellent non-toxic alternative to phenol and nonyl phenol isocyanate blocking agents offering good deblocking conditions and excellent stability at room temperature.

Polymer Building Blocks

Cardolite offers a variety of cardanol grades that can be used as building blocks in high performance specialty chemicals. Cardanol is a versatile molecule that can be functionalized in many different ways on the phenolic OH, aromatic ring and double bonds of the long aliphatic side chain. Recently, Cardolite developed a proprietary process technology that enables very high purity cardanol grades with ultra light color (Gardner of 1 or less) and good stability over shelf life. This leap forward in CNSL processing technology is expanding the use of cardanol as an intermediate and as a replacement for potentially toxic phenols such as nonyl-phenol as it provides lower viscosity, better flexibility, and similar acceleration effects to epoxy-amine reactions.