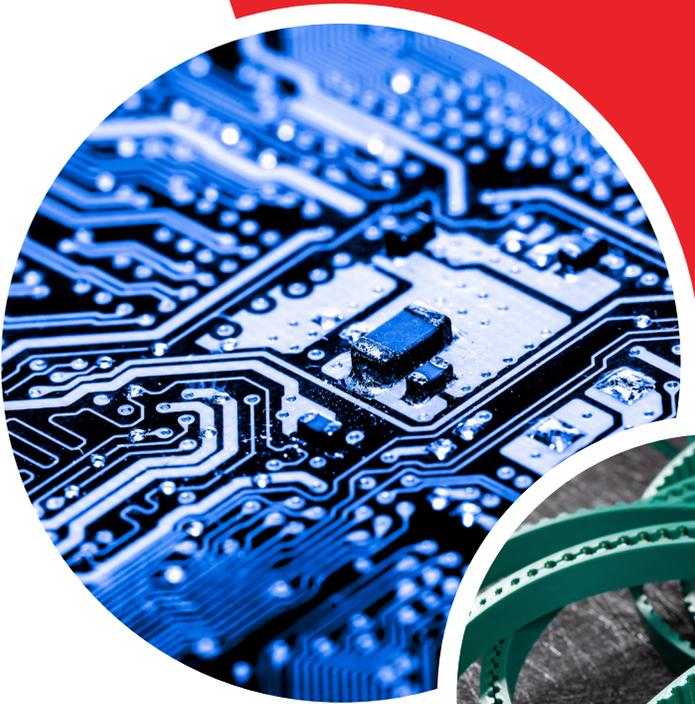


RESIN SOLUTIONS™

PRODUCT GUIDE



Company Overview

Resin Solutions™ is a global manufacturer of specialty low molecular weight additives based on various unique chemistries. We produce functional diene-based polymers, Poly bd®, and (meth)acrylate functional metallic monomers, Dymalink®. Our products have utility in a wide variety of applications in the elastomers, thermoplastics, construction, automotive, and electronics markets.

We work closely with our customers, and our ambition is to offer them the solutions that best fulfill the latest needs of the markets in which they operate.

POLY BD® - LIQUID POLYBUTADIENE RESINS

Poly bd® resins are low molecular weight, functionalized polybutadiene resins. They are functionalized either with terminal hydroxyl groups or internal epoxy and terminal hydroxyl groups. These resins can be chemically modified through reactions with their hydroxyl and/or epoxy groups and are characterized by low volatiles content, low glass transition temperatures, excellent hydrophobicity, and a high level of reactive functionality. Poly bd® resins bring flexibility and water resistance to urethane formulations and improve impact resistance, adhesion, and flexibility of epoxy formulations.

PERFORMANCE CHARACTERISTICS

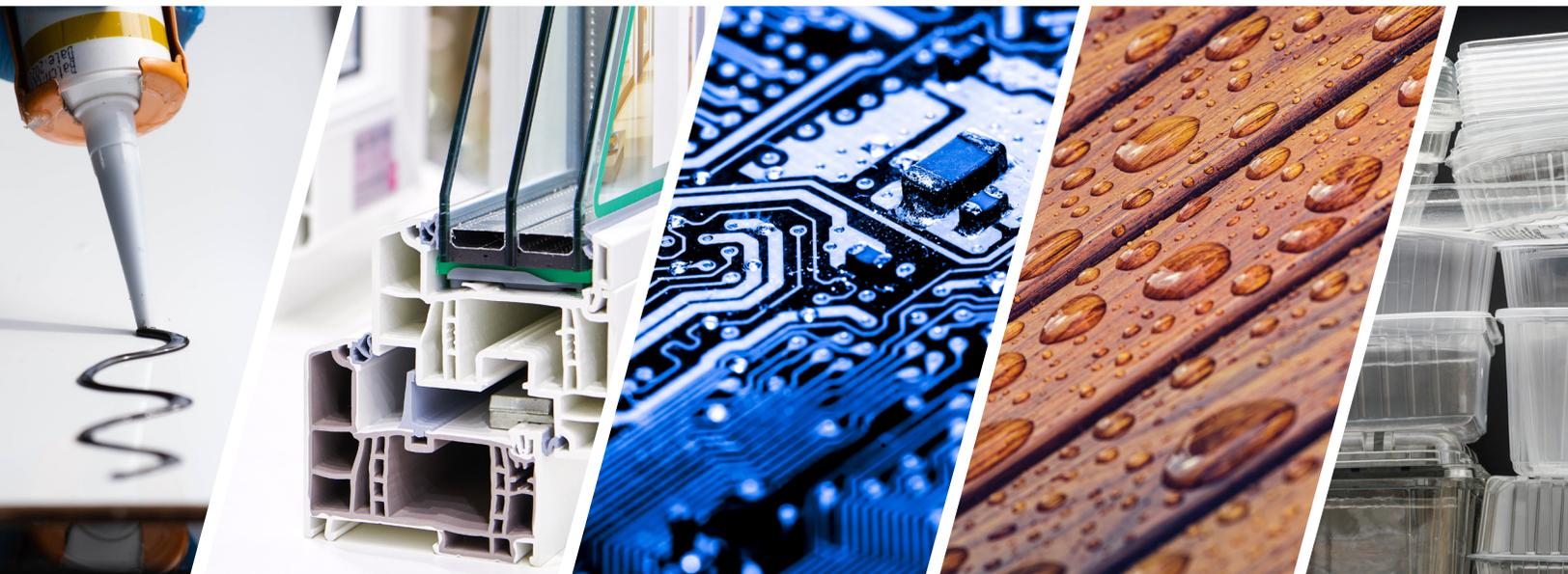
- Low moisture vapor transmission rates (MVTR)
- Adhesion to a variety of substrates
- Excellent water resistance
- Chemical resistance to strong aqueous acid and bases
- Low temperature flexibility
- Thermal cycling stability
- Electrical insulation properties
- High elongation with good elastic recovery

SUGGESTED APPLICATIONS

- Adhesives and sealants
- Coatings
- Waterproofing membranes
- Binders for composites
- Potting and encapsulation compounds

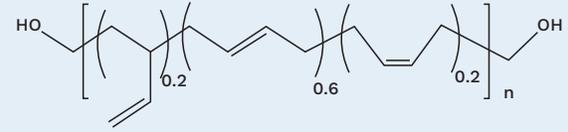
Poly bd® hydroxyl-terminated polybutadienes comply with Title 21 (Food and Drugs) of the Code of Federal Regulations, paragraph 175.300, Resinous and polymeric coatings.

Poly bd® R45 M is regulated by the U.S. Department of State under International Traffic in Arms (ITAR) Category V(e)7 and may not be exported without a license. Poly bd® R45 M may not be resold, diverted, transferred, or otherwise disposed of, to any other country or to any person other than the authorized end user or consignee(s), either in its original form or after being incorporated into other end items, without first obtaining approval from the U.S. Department of State or use of an application exemption. (Refer to the product listings on the next page for more details.)



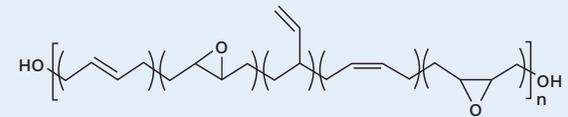
HYDROXYL-TERMINATED POLYBUTADIENE PRODUCTS

| Product | Mn (g/mol) | 1,2 Vinyl (wt %) | Functionality (-OH) | Tg (°C) | Viscosity (cps @ 30°C) |
|-------------------|------------|------------------|---------------------|---------|------------------------|
| Poly bd® R45 HTLO | 2,800 | 20 | 2.3 – 2.5 | -75 | 5,000 |
| Poly bd® R45 V | 2,800 | 20 | 2.3 – 2.5 | -75 | 5,000 |
| Poly bd® R45 M | 2,800 | 20 | 2.3 – 2.4 | -76 | 4,400 |
| Poly bd® R20 LMA | 1,200 | 20 | 2.5 | -70 | 1,400 |



EPOXIDIZED, HYDROXYL-TERMINATED POLYBUTADIENE PRODUCTS

| Product | Mn (g/mol) | 1,2 Vinyl (wt %) | Functionality (-OH) | EEW (g/eq) | Tg (°C) | Viscosity (cps @ 30°C) |
|---------------|------------|------------------|---------------------|------------|---------|------------------------|
| Poly bd® 600E | 1,350 | 20 | 2.5 | 460 | -55 | 7,000 |
| Poly bd® 605E | 1,450 | 20 | 2.5 | 300 | -47 | 22,000 |
| Poly bd® 700I | 3,000 | 20 | 2.3 – 2.5 | 400 | -65 | 12,000 |
| Poly bd® 700S | 3,000 | 20 | 2.3 – 2.5 | 325 | -65 | 19,000 |



DYMALINK® - METALLIC MONOMERS

Dymalink® products are metallic monomers of either diacrylates, dimethacrylates, or monomethacrylates that can be compounded with a variety of different elastomers and thermoplastics.

Use in Elastomers:

Dymalink® can be used to improve the cure kinetics and ultimate physical properties of elastomers cured with organic peroxides and as an efficient activator for accelerated sulfur vulcanization. Each product provides unique structure-property relationships with various elastomers.

PERFORMANCE CHARACTERISTICS

- Rubber-to-metal adhesion without the use of external adhesives
- Improved adhesion in solvent-free coatings and adhesives
- Improved metal adhesion in water-based systems
- Increased mechanical properties

SUGGESTED APPLICATIONS

- Tires
- Power transmission belts
- Hoses
- Wires and cables
- Gaskets and seals
- Coatings
- Adhesives



Use in Thermoplastics:

In thermoplastics, Dymalink® can be coextruded with the olefin to enhance processing, mechanical, and physical properties.

PERFORMANCE CHARACTERISTICS

- Improve melt strength
- Increase use of recycled material
- Incorporate higher regrind levels
- Aid in processing of large, heavy, or deep parts
- Extrusion stability in foaming process
- Improvement in melt stretching and draw
- Reduce thermoforming sag

SUGGESTED APPLICATIONS

- Thermoforming - Recycled thin gauge and virgin/recycled thick gauge
- Extruded foam
- Extruded coating
- Blow molding

ZINC DIACRYLATE (ZDA) PRODUCTS

| Product | Description | Appearance | Specific Gravity @ 25°C |
|----------------|----------------------------|--------------------|-------------------------|
| Dymalink® 633 | ZDA with scorch resistance | white powder | 1.59 |
| Dymalink® 705 | ZDA | white powder | 1.68 |
| Dymalink® 706 | Modified ZDA | white powder | 1.68 |
| Dymalink® 9200 | Modified ZDA | white powder | 1.68 (20°C) |
| Dymalink® 9202 | ZDA masterbatch with LDPE | pellet concentrate | N/A |

Dymalink® 9200 and 9202 are designed for the thermoplastic market.

ZINC DIMETHACRYLATE (ZDMA) PRODUCTS

| Product | Description | Appearance | Specific Gravity @ 25°C |
|---------------|-----------------------------|--------------|-------------------------|
| Dymalink® 634 | ZDMA with scorch resistance | white powder | 1.48 |
| Dymalink® 708 | ZDMA | white powder | 1.49 |
| Dymalink® 718 | Modified ZDMA | white powder | 1.45 |

OTHER DYMALINK® PRODUCTS

| Product | Description | Appearance | Specific Gravity @ 25°C |
|---------------|-----------------------|---------------|-------------------------|
| Dymalink® 636 | Calcium diacrylate | white powder | 1.44 |
| Dymalink® 709 | Zinc monomethacrylate | white powder | 1.88 |
| Dymalink® 719 | Antioxidant | yellow powder | N/A |

Dymalink® 709 is recommended for sulfur cure.