



## Product Information

### VORANOL™ 230-238 Polyether Polyol

#### Description

VORANOL™ 230-238 Polyether Polyol is a general purpose polyether triol with a nominal molecular weight of 700.

Typical uses include prepolymer applications, all kinds of packaging foam, thermal breaks and as a viscosity reducer for rigid foam formulations.

#### Sales Specifications<sup>1</sup>

Properties	Value
Hydroxyl number	225–250
Water, max. %	0.06
APHA color, max	35
pH (1 water/10 methanol)	7.2–8.8
Viscosity @ 100°F, cSt	100–115

1. Specifications are revised periodically. Check with your sales representative for any recent updates.

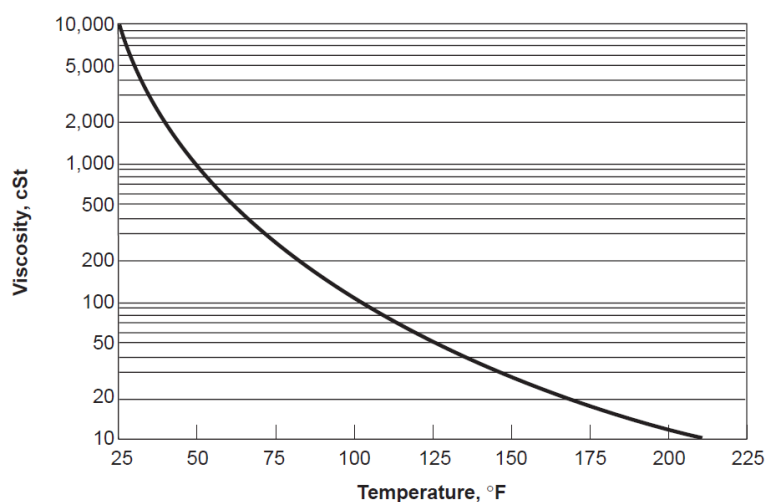
#### Typical Properties<sup>1</sup>

Properties	Value
Antioxidant package	BHT based
Density, lbs./gal 77°F	8.593
gm/cc 25°C	1.029
Specific gravity	
gm/cc, 25/25°C	1.030
Flash point (PMCC)	500°F/260°C
Specific heat (cal / gm °C)	
40°C	0.455
60°C	0.468
100°C	0.495

1. Typical Properties; not to be construed as specifications.

## Typical Properties (Cont.)

Properties	Value
Thermal conductivity (gm cal / cm sec °C)	
30°C	$34.7 \times 10^{-5}$
60°C	$33.8 \times 10^{-5}$
90°C	$33.0 \times 10^{-5}$
Electrical conductivity, (mhos/cm)	
25°C	$6.45 \times 10^{-10}$
Dielectric constant, 20°C	8.6
Refractive index, 25°C	1.4527
Vapor pressure, mm Hg	
25°C	< 0.01



## Viscosity vs. Temperature

Viscosity, cSt			
32°F	77°F	100°F	210°F
3400	238	108	10

## Safety Considerations

Most VORANOL™ polyols generally present no significant hazard in use when simple precautions are followed. However, some VORANOL™ polyols are hazardous. Before working with VORANOL™ polyols it is necessary to understand the hazards involved in handling all of the components, and to establish and follow safe work procedures. Material Safety Data Sheets, product literature, and safe handling and storage information are available for the polyurethane materials supplied by Dow. Recommendations for handling, storage and disposal of any ingredient not furnished by Dow should be acquired from the supplier.

## **Toxicity and First Aid**

### **Skin and Eyes**

When working with VORANOL™ polyols, avoid contact of polyol with eyes or skin. Safety glasses are suggested for use with most polyols, however, some VORANOL™ polyols require that chemical workers' goggles be worn. Skin contaminated with polyols should be washed with soap and plenty of water. If polyol contacts eyes, flush with plenty of low pressure flowing water. If irritation occurs from contact with polyols, get medical attention.

### **Ingestion**

Polyols are low to very low in acute oral toxicity. If a polyol is swallowed, give large amounts of water to dilute. Obtain medical attention.

### **Inhalation**

VORANOL™ polyols typically do not present a significant problem from inhalation. If any adverse effects should occur, get the affected person to fresh air and obtain medical attention.

### **Fire and Explosion**

VORANOL™ polyols will burn under certain conditions and can explode if heated to decomposition temperature in a confined area. VORANOL™ polyols are Class IIIB Combustible Liquids under OSHA. Polyol fires can be extinguished with water fog, carbon dioxide or dry chemicals. Polyol fires not involving isocyanate may be extinguished with alcohol foam. Personnel fighting isocyanate fires or polyol fires involving isocyanate should wear pressure demand, self-contained breathing apparatus and full protective clothing as protection against nitrogen dioxide fumes and isocyanate vapors.

### **Spills and Disposal**

Waste polyol should be burned in an adequate incinerator. Landfill disposal of polyols is not recommended because of the chemical's water solubility. Waste disposal of either isocyanate or polyol should always be in accordance with federal, state and local environmental laws and regulations.

## **Customer Notice**

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they were not intended or tested, Dow personnel are willing to assist in dealing with ecological and product safety considerations. Your Dow representative can arrange the proper contacts.

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