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# VANDERBILT

## Technical Data

### DARVAN® Dispersing Agents

**DARVAN** products are highly effective dispersing agents designed to prevent the agglomeration or coalescence of suspended solids, liquids or gases in aqueous systems. They are used to prevent the settling of solids, to lower the viscosity of pigment slurries, to improve the stability of emulsions, and to keep air bubbles from coalescing in processes such as ore flotation.

#### Typical Properties\*

	<u>DARVAN 1 Spray-Dried</u>	<u>DARVAN 2</u>	<u>DARVAN 670</u>
Composition	Sodium Polynaphthalene Sulfonate	Sodium Lignosulfonate	Sodium Polynaphthalene Sulfonate
Physical Form	Granules	Powder	Powder
Color	Amber	Dark Brown	Amber
Actives	87%	85%	80%
Molecular Weight	800	---	---
pH (1% Solution)	8 to 10.5	7 to 9***	8 to 10.5
Moisture	5% max.	10% max.	8% max
Foaming Tendency	None	Slight	None
	<u>DARVAN 7-N</u>	<u>DARVAN 7-NS</u>	<u>DARVAN 811</u>
Composition	Sodium Polymethacrylate	Sodium Polymethacrylate	Sodium Polyacrylate
Physical Form	Liquid	Powder	Liquid
Color	Colorless	White	Amber
Actives	25%	95%	43%
Molecular Weight	10,000—16,000	10,000—16,000	3500
pH (1% Solution)	9.5 to 11.5**	8.5 to 11.5	7 to 8
Moisture	---	5% max.	---
Foaming Tendency	Very Slight	Very Slight	None
	<u>DARVAN 811D</u>	<u>DARVAN 821 A</u>	<u>DARVAN C-N</u>
Composition	Sodium Polyacrylate	Ammonium Polyacrylate	Ammonium Polymethacrylate
Physical Form	Powder	Liquid	Liquid
Color	White to cream	Pale Yellow	Amber
Actives	86%	40%	25%
Molecular Weight	3500	3500	10,000—16,000
pH (1% Solution)	6 to 9 **	7 to 8**	7.5 to 9 **
Moisture	8% max.	---	---
Foaming Tendency	None	None	Very slight

\* Typical properties are not specifications. Please request copies of our **DARVAN** specifications.

\*\* 5% solution      \*\*\* 10% solution

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## How DARVAN® Dispersing Agents Work:

When finely divided solids are suspended in water, there is a tendency for individual particles to form agglomerates or flocs. The addition of a **DARVAN** product increases the strength of the anionic charge on the particles, causing them to repel one another and remain dispersed rather than agglomerate. The resulting suspension has more fluidity, stability, smoothness and, in the case of pigment suspensions, develops greater color strength.

In oil-in-water emulsions, **DARVAN** dispersing agents also increase the negative charge on the oil phase droplets, and work in concert with the emulsifiers to create products that are more stable and easier to emulsify. The **DARVAN** products described here are not emulsifiers, surfactants or wetting agents, but they help to stabilize the emulsion and prevent separation and creaming.

**DARVAN** dispersing agents increase the activity of agricultural sprays, improve the efficiency of ball and tube mill grinding, and aid in the wet classification of solids, particularly when the particles are finely divided.

## Applications:

Applications for **DARVAN** dispersing agents involve a wide and varied range of markets, as shown in the table below:

	<b>DARVAN 1-SD</b>	<b>DARVAN 2</b>	<b>DARVAN 670</b>	<b>DARVAN 7-N or 7-NS</b>	<b>DARVAN 811 or 811 D</b>	<b>DARVAN 821 A</b>	<b>DARVAN C-N</b>
<b>PRODUCTS</b>							
Adhesives & Sealants	√	√	√	√			
Agricultural Chemicals	√	√	√	√			
Animal Feeds		√					
Ceramics				√	√	√	√
Concrete & Mortar	√	√	√	√	√		
Cosmetics & Toiletries	√	√		√			
Drilling Muds		√					
Dyes			√				
Gypsum Wallboard			√				
Industrial Cleaners			√	√			
Inks			√	√	√		
Latex Paints				√	√		
Pharmaceuticals	√	√					
Pigment Slurries	√	√	√	√	√	√	√
Tanning Agents	√		√				
Water Treatment Chemicals		√	√	√	√		

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	DARVAN 1-SD	DARVAN 2	DARVAN 670	DARVAN 7-N or 7-NS	DARVAN 811 or 811 D	DARVAN 821 A	DARVAN C-N
<b>PROCESSES</b>							
Dispersion of Solids	√	√	√	√	√	√	√
Color Strength Improvement	√	√	√	√	√		
Emulsification Aid	√	√	√				
Viscosity Reduction of:							
Mineral Slurries			√	√	√	√	√
Latexes			√	√			
Starch				√			
Ore Flotation			√	√			
Pitch Control (pulp & paper)	√		√				
Textile Treatment			√	√			

### Some Specific Applications for DARVAN® Products:

#### DARVAN 1 Spray Dried

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- Dispersing and suspending agent for pigments in nail polish.
- Stabilizer for silicone auto polishes.
- Viscosity reducer for TiO<sub>2</sub> dispersions.
- Dispersing agent for pigments used in leather tanning processes.
- Dispersing agent in mortars and cements for terrazzo tiles.
- Suspending aid for the preparation of red blood cell suspensions in Hayem's solution.
- Dispersing agent for plate-counting dilutions in microbiology.

#### DARVAN 2

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- Dispersing agent for plate-counting dilutions in microbiology.
- Prevents gumming in aqueous suspensions of crude drug extracts.
- Dispersing agent for agricultural pesticide wettable powders and flowable liquids.

#### DARVAN 670

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- Dispersing agent for agricultural pesticide wettable powders and flowable liquids.
- Viscosity reducer for agricultural spray mixtures.
- Prevents agglomeration and settling of mixtures of pesticides dispersed in water.

#### DARVAN 7-N or DARVAN 7-NS

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- Dispersing agent for TiO<sub>2</sub>, sulfur, kaolin and nonionic organics used in rubber and ceramics.
- Dispersing agent for agricultural pesticide flowables.
- Dispersing agent for pigments and extenders in latex paints and water-borne coatings.
- Dispersing agent for use in making casting slips for whiteware and refractory compositions.
- Imparts rheological stability to glazes.

### **DARVAN® 811 or DARVAN 811 D**

- Dispersing agent for TiO<sub>2</sub>, kaolin, calcium carbonate and other mineral slurries.
- Dispersing agent for filler pigments in water-based paints, coatings and inks.
- Dispersing agent for minerals used in ceramics, glazes, etc.

### **DARVAN 821 A**

- Dispersing agent for minerals in specialty ceramics where low soda content is required.

### **DARVAN C-N**

- Dispersing agent for casting slips from high oxide electronic bodies where minimum soda content is desired.
- Dispersing agent for slurries for spray driers.

### **How Much DARVAN to Use:**

The amount of **DARVAN** required for dispersant and stabilization applications will vary with the composition of the product. Simple experimentation will determine the proper amount for each specific use. Usually, the concentration required is between 0.25% and 5.0%, based on the weight of the ingredients being dispersed.

### **FDA and EPA Status of DARVAN Dispersing Agents**

<b>PRODUCT</b>	<b>FDA CFR TITLE 21 SECTION</b>	<b>EPA CFR TITLE 40 SECTION</b>	<b>LIMITATIONS</b>
<b>DARVAN 1 SD &amp; DARVAN 670</b>	175.105		None
	175.300		≤0.6% by weight of cement solids in can end cements for containers having a capacity of not less than 5 gallons.
	176.170		For use as an adjuvant to control pulp absorbency and pitch content prior to sheet-forming operations in paper manufacturing.
	176.180		None
	176.210		None
	177.1200		0.1% for use as an emulsifier.
	177.1210		≤0.2% by weight of closure sealing gasket compositions.
	177.1650		None
	177.2600		Emulsifier
	182.99		Surfactant
		180.1001 (d)	Surfactant
<b>PRODUCT</b>	<b>FDA CFR TITLE 21 SECTION</b>	<b>EPA CFR TITLE 40 SECTION</b>	<b>LIMITATIONS</b>
<b>DARVAN 2</b>	173.310		None
	175.105		None
	175.300		For use in can end cement.
	176.170		None
	176.180		None
	176.210		None
	177.1210		≤0.2% by weight of closure sealing gasket compositions.
	177.2600		Emulsifier

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PRODUCT	FDA CFR TITLE	EPA CFR TITLE	LIMITATIONS
	21 SECTION	40 SECTION	
DARVAN® 2 (continued)	178.3120		None
	182.99		Surfactant
	573.600	180.1001 (c) 180.1001 (e)	≤4% of animal feed. Surfactant Surfactant
DARVAN 7-N & DARVAN 7-NS	173.310		None
	175.105		None
	176.170		≤0.3% by weight of the coating for viscosity control.
	176.180		≤0.3% by weight of the coating composition for viscosity control.
	182.99	180.1001 (c)	pH control. pH control.
DARVAN 811 & 811 D	175.300		
	175.105		
	176.170		
	176.180		

FDA 21 CFR SECTION	SUBJECT HEADING
173.310	Boiler water additives.
175.105	Adhesives.
175.300	Resinous and polymeric coatings.
176.170	Components of paper and paperboard in contact with aqueous and fatty foods.
176.180	Components of paper and paperboard in contact with dry food.
176.210	Defoaming agents used in the manufacture of paper and paperboard.
177.1200	Cellophane.
177.1210	Closures with sealing gaskets for food containers.
177.1650	Polysulfide polymer-polyepoxy resins.
177.2600	Rubber articles intended for repeated use.
178.3120	Animal glue
182.99	Adjuvants for pesticides chemicals.
573.600	Lignin sulfonates (for animal feed).
<b>FDA 40 CFR SECTION</b>	<b>SUBJECT HEADING</b>
180.1001	Inert ingredients in pesticide formulations, exempt from tolerance requirements.

DARVAN is a registered trademark of R.T. Vanderbilt Company, Inc.

Literature, samples, specifications and technical assistance are available from:  
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