



**Owensboro Specialty Polymers, Inc.**  
Chemistry that Connects, People that Care

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# **Daratak<sup>®</sup>, Everflex<sup>®</sup>, Versaflex<sup>®</sup> PVAc Latex Recommendations and Formulations**

**Owensboro Specialty Polymers, Inc.**  
5529 US 60 E.  
Owensboro, KY 42303

OSP\_TDS\_PVAc\_FactSheet3\_Rev.1

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# Polymer Recommendations and Formulations

Polyvinyl acetate emulsions are employed in a wide variety of adhesive uses. Compounding optimizes many inherent properties in these emulsions.

## **Paper and Board Adhesives**

One of the major applications of polyvinyl acetate-based adhesives is in the manufacture of paper and paperboard products. Because of their inherent quick grab and rapid gain in bond strength properties, Daratak<sup>®</sup> polyvinyl acetate emulsions are particularly suitable for high-speed box-making adhesives. Selection of the proper Daratak emulsion for formulating in a paper or board adhesive depend on the end use.

### *Critical Requirements*

- Quick Grab
- Rapid gain in bond strength
- Machineability
- Retack in certain applications

### *Emulsion Recommendations*

Daratak 56L	Used where resistance to cold flow and high temperature requirements exist, such as bags which are used in a hot, humid environment. As a fast film former, it is used where quick fiber tear is desired.
Daratak 62L	Similar to 56L but has a higher initial viscosity.
Daratak 61LT	Used where borax-tolerance is required.
Daratak 92L	Similar to 61LT but with a higher viscosity response to plasticizer addition.
Daratak 71L	A good general purpose polymer for case-sealing adhesives that gives very fast fiber tear. Has the ability to reach high viscosity with addition of solvents and plasticizers.
Daratak 17-300	Used in low cost paper and board adhesives which still require adequate viscosity levels. Excellent wood adhesion.
Daratak B	A very fast copolymer emulsion designed for use on difficult-to-adhere-to substrates.

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### ***Low cost Seal or Glue Lap Adhesive***

Total Solids 44-46%

Components	Pounds
Daratak 17-300	200
Dibutyl phthalate	10
Water	100
Acrysol <sup>®</sup> ASE 75	30
Water	175
ASP <sup>®</sup> -400	200
Ammonium Hydroxide 28% solution	20

#### Directions

1. Add Daratak 17-300 and dibutyl phthalate to mixer and stir until smooth.
2. Mix Acrysol ASE 75 with water and add to mixture. Stir until smooth.
3. Prepare a slurry of ASP-400 by stirring it into water at room temperature. Add the slurry to mixture of 1 and 2 and stir until a homogeneous mixture is obtained.
4. Add ammonium hydroxide slowly to batch while stirring and stir until a smooth mixture is obtained.

### ***Case Sealing Adhesive (Excellent penetration)***

Total Solids 47-51%

Components	Pounds
Daratak 71	80
Daratak 17-300	44
Butyl Benzyl Phthalate	20
1,1,1-Trichloroethane	40
Water	q.s.

#### Directions

1. Add Daratak 71L and 17-300 together.
2. Mix butyl benzyl phthalate in until a homogenous mixture is obtained.
3. Add 1,1,1-trichloroethane and mix until homogeneous.
4. Add water to adjust viscosity as desired.

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### ***Wax Bag Adhesive***

Total Solids 26-27%

Components	Pounds
Daratak 71L	90
Diethylene Glycol	1
1,1,1-Trichloroethane	100
Water	q.s.

#### Directions

1. Mix Daratak 71L and diethylene glycol together until homogeneous.
2. Add 1,1,1-trichloroethane to above mixture and stir until a smooth mixture is obtained.
3. Add water to adjust viscosity as desired.

### **Wood-Bonding Adhesive**

Daratak polyvinyl acetate emulsions are used in wood-bonding adhesives because of their excellent affinity for wood.

#### ***Critical Requirements***

- Good bite and wood fiber tear
- Adequate open time
- No separation
- Good mechanical handling
- Good bond aging
- No cold flow

#### ***Emulsion Recommendations***

Daratak 56L	Used where heat resistance and cold flow resistance are required.
Daratak 17-200	A good, general purpose wood adhesive polymer used where open time is important.

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## **Wood Adhesive With a Long Open Time**

Total Solids 52-54%

Components	Pounds
Santicizer 160 Plasticizer	2.00
Phenol	1.60
Daratak 56L	200.0
Polyvinyl Alcohol*	
15% solution	20.0
Water	q.s.

### Directions

1. Add Santicizer 160 and phenol in mixer and stir until phenol is all dissolved.
2. Add Daratak 56L to mixture of plasticizer and phenol and stir until smooth.
3. Add polyvinyl alcohol solution and stir until a homogenous mixture is obtained.
4. Use water to adjust total solids and viscosity.

Prepare a stock solution of polyvinyl alcohol by slurring 5.5 pounds of Elvanol 51-05 and 9.5 pounds of Elvanol 72-60 in 85 pounds of water at room temperature with good agitation. Heat for 20-25 minutes at 185-190° F. Add water for viscosity or solids control.

## **Wood Adhesive**

Total Solids 57-59%  
Viscosity 4,000-5,000 cps

Components	Pounds
Daratak 17-200	800
Santicizer 160 Plasticizer	24
Phenol	8
Daxad <sup>®</sup> 30	32
Walnut Shell Flour	80

### Directions

1. Add Daratak 17-200 to mixer.
2. Mix Santicizer 160 and Phenol and add to Daratak 17-200 stir until smooth.
3. Prepare a slurry of walnut shell flour by slurring in mixture of water and Daxad 30 at room temperature. Add slurry to the mixture of q and 2 and stir until a homogeneous mixture is obtained.

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### ***Wood Adhesive***

Total Solids 55%  
Viscosity 1,500-2,000 cps

Components	Pounds
Daratak 17-200	100.00
Santicizer 160 Plasticizer	1.65

#### Directions

1. Mix Daratak 17-200 and Santicizer 160 and stir until a homogenous mixture is obtained.

## **Non-Porous Surface Adhesives**

Daratak Polyvinyl acetate emulsions have been used in adhesives for bonding non-porous to porous substrates for some time. This can be accomplished by properly compounding a homopolymer to obtain specific adhesion to the non-porous stock or by utilizing one of our specialty copolymer emulsions.

### ***Critical Requirements***

- Good Adhesion
- Good bonding aging
- Machineability
- Temperature resistance
- Water resistance

### ***Emulsion Recommendations***

Daratak B Used to obtain adhesion to certain non-porous surfaces such as vinyl sheeting, aluminum foil, and PVdC coatings.

Daratak 61LT Used to obtain adhesion to foil substrates.

### ***Aluminum Foil Adhesive***

Total Solids 56-58%

Components	Pounds
Daratak 61LT	100
Plasticizer #8	15

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1,1,1-Trichloroethane	5
Water	q.s.

Directions

1. Add the Daratak 61LT and Plasticizer #8 together and mix thoroughly.
2. Blend in 1,1,1-trichloroethane and stir until homogeneous.
3. Add water to adjust the viscosity and total solids as desired.

***Vinyl Sheeting Adhesive***

Components	Pounds
Daratak B	100
Oleic Acid	5
1,1,1-Trichloroethane	5

Directions

1. Add the ingredients as listed, stirring well after each addition.

***Fire Retardant\* Vinyl Sheeting Adhesive***

Total Solids	61-62%
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Components	Pounds
Daratak B	100
Oleic Acid	3
Celluflex <sup>®</sup> CEF	20
1,1,1-Trichloroethane	5
Mica 325	10

Directions

1. Add the ingredients in the order listed, stirring until smooth after each addition.

\*Tests should be run on finished system. Owensboro Specialty Polymers, LLC makes no warranty as the effective fire resistance of this formula.

**Heat Seal Adhesive**

Daratak polyvinyl acetate emulsions are used in heat sealing adhesives because of the variability in activating and blocking temperatures which can be attained with these materials. In addition, Daran<sup>®</sup> SL159 is suitable for use, as is, over paper or primed film.

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### ***Critical Requirements***

Activating  
Blocking temperature

### ***Emulsion Recommendations***

Daratak 61LT                      Good general purpose polyvinyl acetate homopolymer for heat setting.  
Daratak B                              Used where lower heat sealing temperatures are desired.  
Daratak 56L                            Used on applications where block resistance is preferred.

### ***Heat Sealing Adhesive***

Components	Pounds
Daratak 61LT	100
Benzoflex 50	3
HEC	10-15
Water	q.s.

#### Directions

1. Add Benzoflex 50 to Daratak 61LT and mix until homogeneous.
2. Add desired amount of stock solution of HEC and mix until smooth.
3. Add water to desired viscosity.

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