

NUMBER 4851

## PVP/VA E-Series copolymers

### Description

PVP/VA E-Series copolymers are linear, random copolymers produced by the free-radical polymerization of the monomers in ratios varying from 70/30 to 30/70 vinyl acetate (VA) to vinylpyrrolidone (VP). The E-Series are supplied in Ethanol (SDA-40B).

### Key Attributes

- PVP/VA polymers produce transparent, flexible, oxygen-permeable glossy films which adhere to glass, plastics and metals.
- Soluble in alcohols, esters and ketones, insoluble in ethers and aliphatic hydrocarbons. Soluble in water when VP content is greater than 50%. Exhibits both cohesive and adhesive properties.
- Effective in reducing surface tension of water and in reducing oil/water interfacial tension.
- Increased VA content increasing hydrophobicity and decreases hygroscopicity and Tg.
- These properties, coupled with the ability to control their hydrophilicity through monomer composition, enable extensive industrial use.

### Applications and Usage Notes

- In remoistenable, hot-melt adhesives.
- In a hot-melt adhesive for a diaper wetness indicator system.
- As a binder for dry-film photoresists.
- In solder masks utilizing aqueous processing.
- Improves print receptivity with respect to inkjet coatings.
- Hot stamping foils adhesive.

## Typical Product Properties

Property	E-335	E-535	E-635	E-735
Appearance	Clear viscous liquid	Clear viscous liquid	Clear viscous liquid	Clear viscous liquid
VP/VA ratio	30 / 70	50 / 50	60 / 40	70 / 30
Color (APHA) – as is	60 max.	100 max.	100 max.	150 max.
K-Value (1% in EtOH)	25 – 35	30 – 50	30 – 45	35 – 50
% Moisture	0.5 max.	0.5 max.	0.5 max.	0.5 max.
% Solids	48 – 52	48 – 52	48 – 52	48 – 52
% Nitrogen	3.5 – 4.5	5.8 – 6.8	7.0 – 8.0	7.5 – 9.4
% Ash	< 0.01	< 0.01	< 0.01	< 0.01
Mw (PEO standards)	28,800	36,700	38,200	56,700
Polydispersity (Mw/Mn)	5.05	6.0	-----	6.8
Intrinsic Viscosity [η] @ 25°C (dl/g)	0.265	0.363	0.330	0.429
Brookfield viscosity, cps <sup>a</sup>	2000	3000	3600	11400
Specific Gravity @ 25°C	0.945 – 0.965			
Tg (°C)	69	96	106	117
Cloud Point (°C, 5% aq.)	< 0°C <sup>b</sup>	< 0°C <sup>b</sup>	12	58
Film Pencil Hardness	4H	4H	No data	3H
Film Adhesivity <sup>c</sup>	85.2	51.8	No data	54.0
Saponification Number (mg KOH/g) – as is	204	151	126	95

<sup>a</sup> DV-II, Spindle RV #7, 20 rpm, 22-23°C

<sup>b</sup> Cloudy to 0°C

<sup>c</sup> IMASS Slip/Peel Tester – Force (g) to Separate

## Packaging Information

Product	Physical Form	Pkg Type	Net Wgt (lbs)	Net Wgt (kgs)
PVP/VA E-335	Liquid	Steel Drum	400 lbs	181.4 kgs
PVP/VA E-335	Liquid	HDPE IBC	2115 lbs	959.4 kgs
PVP/VA E-535	Liquid	Steel Drum	400 lbs	181.4 kgs
PVP/VA E-635	Liquid	Steel Drum	400 lbs	181.4 kgs
PVP/VA E-735	Liquid	Steel Drum	400 lbs	181.4 kgs
PVP/VA E-735	Liquid	HDPE IBC	2115 lbs	959.4 kgs
PVP/VA E-735	Liquid	Bulk TW	44,000 lbs	19,960 kgs

## Product Safety Information

For health and safety data and handling, storage and disposal procedures, please refer to the Safety Data Sheet (SDS) and product label.

To learn more, visit [ashland.com](http://ashland.com)

EMAIL: [specialtiessolutions@ashland.com](mailto:specialtiessolutions@ashland.com)

CHINA Tel: +86 212402 4888 DUBAI Tel: +9714 3818512 INDIA Tel: +91 22 61484646  
 MEXICO Tel: +52 55 52 76 6121 SINGAPORE Tel: +65 6775 5366  
 SWITZERLAND Tel: +4152 560 55 00

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