

NUMBER 5706

pvp/va copolymers

excellent film formers with varying degrees of water solubility and humidity resistance

| formulator benefits | formulation benefits |
|---|---|
| <ul style="list-style-type: none"> ○ forms hydrophilic, transparent, flexible thermoplastic, oxygen-permeable films which adhere to dry skin and hair ○ creates films with good adhesion, luster and hardness ○ gives more flexible films with less tack and increased water resistance than polyvinylpyrrolidone(PVP) homopolymers ○ brings adhesive and cohesive properties ○ soluble in water when vinyl pyrrolidone(VP) content is >50% ○ long history-of-use as hair fixative polymers ○ good propellant compatibility for use in aerosols ○ easy-to-use, alcohol-free solution (w-635, w-735) ○ tablet binder for direct compression and dry granulation tablet processes (s-630) | <ul style="list-style-type: none"> ○ provides long-lasting hair styling with strong hold ○ adds water resistance to maintain style and curl retention in high humidity conditions ○ offers more flexible/elastic hold and less flaking to styling products (compared to PVP) ○ provides "wet look" gels (w-series) ○ vegan suitable ○ halal certified by IFANCA¹ (e-635, w-735, s-630 only) ○ Kosher certified (e-635, e-735, w-635, w-735, s-630 only) |

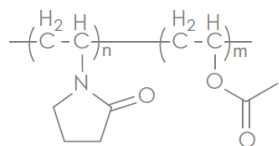
1. Islamic Food and Nutrition Council (IFANCA)

application hair care and hair styling; skin care/pore strips and masks; color cosmetics; oral care/denture and appliances cleaning tablets

end use product forms liquids, aerosols and non-aerosol pump hair sprays, mousses, gels, creams/lotions, pomades, waxes and pastes, tablets, strips, masks

available formulations from Ashland hair care/styling stick, mousse, pomade, gel

chemistry



linear random copolymers of vinyl pyrrolidone (VP) and vinyl acetate (VA)

INCI name: VP/VA Copolymer

E and I series as well as S-630 are unpreserved. W-735 and w-635 are preserved with laurtrimonium chloride.

typical properties

PVP/VA copolymers are available in a range of VP to VA ratio. With increasing VP monomer content, the copolymers have increased water solubility (hydrophilicity), film hardness, adhesive strength, glass transition temperature (T_g) as well as solubility in aerosol spray propellants. With lower VP monomer content, the polymers offer greater humidity resistance, flexibility and cohesive strength.

| | e-335 | e-535 | e-635 | e-735 | i-335 | i-535 | i-735 | w-635 | w-735 | s-630 |
|-----------------------------|-----------------------|-------|-------|-------|-----------------------|-------|-------|------------------|------------------|------------------|
| appearance | clear, viscous liquid | | | | clear, viscous liquid | | | viscous liquid | | white powder |
| solvent | ethanol | | | | isopropanol | | | water | | -- |
| % solids, w/w | 48-52% | | | | 48-52% | | | 48-52% | | 90-100% |
| VP/VA ratio | 30/70 | 50/50 | 60/40 | 70/30 | 35/65 | 50/50 | 70/30 | 60/40 | 70/30 | 60/40 |
| k-value(1% in ethanol) | 25-35 | 30-50 | 30-45 | 35-50 | 20-30 | 25-35 | 28-36 | 26-34 | 25-35 | 30-50 |
| T _g (°C) | 69 | 96 | 106 | 117 | 71 | 89 | 108 | 99 | 114 | 110 |
| viscosity (cP) ^a | 2,000 | 3,000 | 3,600 | 11400 | 1,000 | 2,800 | 5,600 | 1,800 | 2,600 | 670 ^b |
| color ^c (APHA) | <100 | <100 | <100 | <150 | <40 | <60 | <80 | <50 ^c | <80 ^c | <10 ^c |

a) as supplied (unless noted), Brookfield DV-II, Spindle RV #7, 20 rpm, 22-23°C

b) 8% solids in water @ 30°C

c) as is, maximum. W-635 and w-735 are 10% solids, S-630 is 5% in ethanol

These data are typical properties, but are not specifications. See specification sheet or certificate of analysis for current specification.

formulation guidelines

| | |
|--|--|
| recommended use levels | 0.3-6.0% on solids basis |
| temperature/mixing conditions | no neutralization, cold processable/mixing |
| when to add | add at any stage |
| tips from our technical solvers | suitable for aqueous, alcohol and hydroalcoholic systems |

safety, handling, and storage

keep containers tightly closed when not in use. store in a cool, dry place, out of direct sunlight.

avoid moisture pick up.

The e and i series have flash points in the range of 50-55°F (10-13°C).

additional information concerning safety, handling and storage is supplied in the safety datasheet, which can be made available upon request. such information includes:

- o classification and labeling per regulation for transport and for dangerous substances
- o protective measures for storage and handling

a toxicology summary can also be made available, on a confidential basis, by contacting a local Ashland representative.

packaging: available in drums. Totes available (upon request)

S-630 is available in 49.9 kg drum; all other grades available in 208.2 L drum (w-735 and w-635 drums have net weight of 204.12 kg; all other drums (except s-630) are 181.44 kg net weight)

regulatory

CAS No. 25086-89-9

INCI name is also listed in China, Japan and Korea.

other regulatory information available on request.

keywords: textured hair, PVP derivatives