

# Product Fact Sheet

## ARISTOFLEX<sup>®</sup> AVC

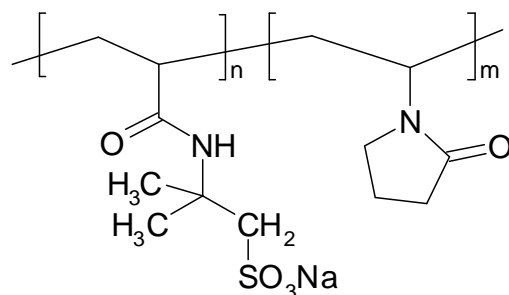


Gelling agent for aqueous systems and thickening agent for oil-in-water emulsions

**Chemical Name** Polymeric sulfonic acid, neutralized

**INCI Designation:** Sodium Acryloyldimethyltaurate/VP Crosspolymer

**General formula**



CLARIANT INTERNATIONAL LTD

Rothausstrasse 61  
4132 MuttENZ  
Switzerland

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### Product properties<sup>1</sup>

Appearance (20°C)	white powder
Solid content min.	92.00 %
Water	max. 7.00 %
pH value (1% in dist. water)	4.0 - 6.0
Viscosity (1% in dist. water)	40000 - 60000 mPas

### Application

Aristoflex<sup>®</sup> AVS is a synthetic polymer used as gelling agent for aqueous systems and as texturizer, thickener for oil-in-water emulsions. The polymer is pre-neutralized, easy to use and provides formulations with excellent yield value, corresponding to superior stability even in the absence of additional emulsifier. Emulsions formulated with Aristoflex<sup>®</sup> AVS provide favorable shear thinning effects and viscoelastic properties. Besides the rheological aspects, excellent sensory properties (good skin feel, low degree of stickiness and/or tackiness) characterize formulations comprising Aristoflex<sup>®</sup> AVS.

<sup>1</sup> These characteristics are for guidance only and not to be taken as product specifications. The tolerances are given in the product specification sheet. For further product properties, specifications, safety and ecological data, please refer to the MSDS

Based on a polymer backbone derived from sulfonic acid, O/W emulsions can be formulated even at low pH, enabling easy incorporation of e.g. AHA's.

Aristoflex® AVS is compatible with ascorbic acid and derivatives as well as with DHA. Thus Aristoflex® AVS is especially suitable for thickening cosmetic formulations for skin whitening and self tanning. Aristoflex® AVS shows also good compatibility with organic solvents (ethanol, acetone) and is stable towards UV radiation and high shear stress. The amount of Aristoflex® AVS used in personal care formulations is typically in the range of 0.5 – 1.2 %

### **Preparation of emulsions**

Aristoflex® AVS can be used to prepare O/W emulsions in both hot and cold process. Aristoflex® AVS is typically added to the oil phase (comprising emollient and emulsifier), slight agitation facilitates dispersion. Any small aggregates can be broken up easily with gentle stirring. The mixing reactor should be completely dry of moisture to prevent the polymer from migrating prematurely to any water already present and becoming gummy.

Production facility requirements will usually govern the emulsification method applied. Aristoflex® AVS can be used for both direct emulsification (i.e. adding the oil phase to the water phase) and inverse emulsification (i.e. adding the water phase to the oil phase). As Aristoflex® AVS is pre-neutralized, no neutralization step is required. Finally, the emulsion is homogenized with high shear mixing equipment.

Emulsions comprising Aristoflex® AVS are brilliant and glossy, they provide excellent spreadability and fast absorption. The O/W emulsions are characterized by dry aesthetic feel without tackiness and are especially suitable as light, elegant formulations.

### **Preparation of emulsifier-free cream-gels**

Another special feature of Aristoflex® AVS is the stabilization of water-insoluble liquids (e.g. oil) WITHOUT using additional emulsifiers. The resulting O/W formulations are also known as pseudo-emulsions.

Using Aristoflex® AVS, emulsifier-free cream-gels can be formulated, opening the door to novel, modern formulations with special rheological profiles (creamy, not 'jelly', non sticky/tacky) and superior skin compatibility. The resulting compositions are light and creamy, differing greatly from the jelly or gelatin-like appearance often achieved when formulating with 'traditional' thickeners.

The stabilizing effect of Aristoflex® AVS is explained by the cross-linked structure of the polymer, providing a yield value and thus 'trapping' the oil droplets or solids (e.g. pigments) in the water/polymer matrix.

'Yield value' reflects the minimum force that must be applied to the liquid to start disrupting the structure imparted by Aristoflex® AVS, so flow can occur.

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## Preparation of aqueous gels

Aqueous gels (e.g. hair gels) are prepared by adding the water phase to Aristoflex® AVS. Special care should be taken for good agitation.

The transparency of the resulting aqueous gels is depending on the amount of Aristoflex® AVS used in the formulation. Concentrations of Aristoflex® AVS 1% and higher provide transparent, clear gels. Slightly turbid gels can be transformed into clear formulations by addition of approx. 5% solvent, e.g. glycerin. The best gel clarity is obtained using water which is relatively free of metal ions (demineralized or deionized).

Aristoflex® AVS has a good compatibility with other polar organic solvents. Hydro-alcoholic, transparent gels can be made comprising more than 50% ethanol. Typically, the water/ethanol mixture is added to Aristoflex® AVS. Ethanol can be used to dissolve active ingredients while avoiding the use of solubilizers such as PEG-40 Hydrogenated Castor Oil, Polysorbate 20, or similar ingredients. In this way it is easy to prepare hydro-alcoholic gels containing perfume oils, oil-soluble UV-filters, actives (e.g. bisabolol), film formers etc. In case of high Ethanol content additional preservation is not required.

To manufacture hydro-alcoholic gels based on Aristoflex® AVS the best option is to first prepare the aqueous gel, and subsequently add to the gel a solution of the active (or film former) dissolved in ethanol. The addition is preferably done by using a slow moving anchor stirrer to minimize trapping of air bubbles.

## Limitations

Similar to all other polyelectrolytes, e.g. carbomers, Aristoflex® AVS is sensitive to electrolytes. Therefore, Aristoflex® AVS is not suitable to thicken shampoos, shower gels and other systems comprising larger amounts of salt. Aristoflex® AVS can be used in a broad pH range of 4.0 – 11.0.

## Storage recommendations

The product is stable when stored in closed original containers. It must be protected from humidity during storage. Further information on handling, storage and dispatch is given in the EC safety data sheet.

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