Technical Data Sheet

Polygel HG

Rheology modifier

Chemical and physical characteristics (*)

Chemical Name	Carboxyvinyl polymer	Appearance	Fine white powder
INCI NAME	Carbomer	Bulk density (g/cm^3)	0.20-0.23
No. CAS	9003-01-4	pH (0.5% water dispersion)	2.7-3.5
		Average equivalent weight	ca. 76

Viscosity (mPa·s) of neutralized dispersions (Brookfield RV, 20 rpm, 25°C)

% Dispersion	Viscosity		Spindle
	Min.	Max	
0.2	20,000	35,000	6
0.5	45,000	70,000	7

(*) Typical values not qualified for quality control purpose

Applications

POLYGEL HG is a synthetic polymer, benzene free, well known and widely used in the cosmetic industry as thickener and suspending agent thanks to its safety and versatility.
POLYGEL HG dispersions are characterized by high viscosity and clarity (see Fig. 1 and 2). Therefore it is very suitable for formulating sparkling and clear gels as well as for stabilizing emulsions.
Normal percentage of use is between 0.1 and 1.5% depending on type of formulation and final desired viscosity.

Use

When POLYGEL HG is dispersed into water and neutralized with an appropriate base, a clear gel is formed. Dispersion should be made by slow addition of the polymer in order to avoid the formation of lumps and stirring until all particles are completely hydrated. Turbulent agitation should be avoided to prevent trapping of air which would be difficult to remove from the finished product.

During the preparation of emulsions, POLYGEL HG can be dispersed also in the oil phase obtaining free flowing dispersions with concentration up to 30%.
The neutralization can be carried out with inorganic bases (such as NaOH, KOH, NH_4OH) or with organic amines (such as TEA, AMP, AMPD). To neutralize 1 g of POLYGEL HG to pH 7, ca. 0.01 equivalent of base are required (e.g. 0.4 g of

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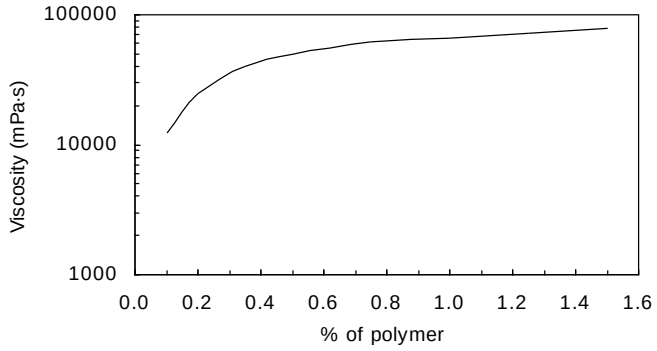
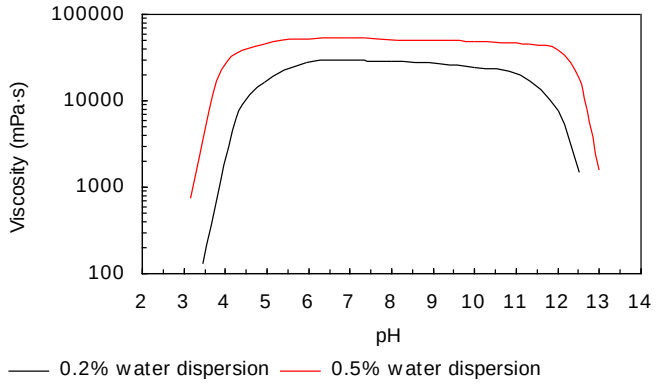
NaOH, 0.9 g of AMP, 1.5 g of TEA). It is advisable to add strong bases previously diluted into water at a concentration not higher than 10%.
Inorganic bivalent bases must be avoided because an ionic cross-link can occur causing precipitation of the polymer.

Figure 1 - Viscosity vs polymer concentration



Water dispersion neutralized to pH 7 with NaOH

Figure 2 - Viscosity vs pH of polymer dispersion



Prolonged high shear during and after neutralization is not advisable since this could possibly lead to a permanent loss of viscosity.
The addition of electrolytes can cause a drop of viscosity; this is particularly evident with salts of bi- and trivalent cations.
In normal conditions, gels prepared with POLYGEL HG neither prevent nor promote the growth of micro-organisms; therefore the addition of a suitable preservative system is advisable.
UV rays can cause loss of viscosity in POLYGEL HG gels. The addition of water-soluble UV-absorbers, such as UVASORB S5 (Benzophenone-4), can help for preventing polymer degradation.

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Toxicological information

LD_{50} (oral)	> 2000 mg/kg
Acute skin irritation	non irritant
Acute eye irritation	non irritant
Skin sensitization (max. test)	non-sensitizing

Transport, storage and handling

Labelling: product not classified as hazardous according to international transport regulations.
Store in the original closed containers in a dry cool place. Protect from moisture. Do not breathe dust and avoid contact with skin, eyes and mucous membranes. In case of contact, wash immediately with plenty of water.

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