

DEGACRYL® RG S hv, mv

Alkali-soluble methacrylic acid copolymer in powder form

Product properties

Physical form:	fine powder available as follows:
	- high viscosity DEGACRYL RG S hv
	- medium viscosity DEGACRYL RG S mv

Typical Properties

Property	Value (approx.)	Unit	Method
Ionic character	anionic		
Solubility	alkali-soluble		
Solids content	95 ± 5	%	
Powder density	560	g/l	DIN 53 468
Acid value	390 - 440	mg	KOH/g

Handling

Avoid dust formation!

General remarks

Packaging	paper bags with PE lining (25 kg)
Storage	In the absence of moisture, product keeps for 3 years / from date of delivery

Properties of the solutions

Viscosity of a 3% ROHAGIT S solution as a DEGACRYL RG S hv 7.700 - 11.000 mPas (III/6)
 sodium salt at 20°C (Brookfield viscometer, DEGACRYL RG S mv 3.800 - 5.500 mPas (III/6)
 LVT)

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Film properties

The film properties of the salts of DEGACRYL RG S are determined by the type and quantity of the base used for neutralisation. The alkali and ammonium salts provide clear, hard and brittle films. The film of the triethanolamine salt is softer. It should be noted, however, that the salts are hygroscopic substances which, depending on the relative humidity, take up greater or smaller quantities of water and then swell. The absorbed water has a plasticising effect. Films of the alkali and alkaline earth salts and of the salts of least volatile amines dissolve in water with ease. The swellability and water-solubility of the ammonium salts depend largely on the drying conditions, since the water resistance of the films increases with the escape of ammonia.

Applications

The salts of DEGACRYL RG S with alkalis, alkaline earths, ammonia and amines in the form of their aqueous solutions are suitable for many technical and cosmetic purposes:

They can be used as thickeners, dispersing agents, emulsifiers and stabilisers for aqueous systems,

as thickening agent in cosmetics,
as lubricants, adhesives and binders,
as sizing and finishing agents for textile yarns and fabrics,
as thixotropic agents, e.g. in tile adhesives,
for treating metal surfaces and
as forging and wire-drawing aids.

Hints for processing

Preparation of aqueous solutions: DEGACRYL RG S as supplied by us is insoluble but swellable in water. Added bases effect its neutralisation to water-soluble salts. Organic bases, e.g. triethanolamine or aminomethylpropanol, are also suitable as neutralising agents. Triethanolamine gives solutions of particularly high viscosity.

Neutralisation

To neutralise 1 kg of DEGACRYL RG S (100 % solids), for example

312 g sodium hydroxide or
437 g potassium hydroxide
530 g ammonia (25% aqueous solution)
1162 g triethanolamine
694 g aminomethylpropanol
227 g magnesium hydroxide
289 g calcium hydroxide

are required.

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The quantities are calculated according to the following formula:

$$M = \frac{M_B \cdot 7,79}{W_B}$$

M = mass of base required for neutralisation [in g]
 MB = molar mass of base [in g/mole]
 7.79 = factor
 WB = valency factor of base

Besides the above bases, alkali and alkaline-earth carbonates and phosphates can be used.

Procedure

Proceed as follows to prepare DEGACRYL RG S solutions with alkalis and amines:

Suspend the weighed amount of DEGACRYL RG S in water with stirring and allow 5 to 10 minutes for swelling. Then stir in the required amount of base in one go, which results in a sudden viscosity increase. Continue stirring until dissolution is completed. This process can be significantly accelerated if hot water (60 - 80 °C) and a highly concentrated base are used.

For neutralising DEGACRYL RG S by means of alkaline earths (Ca/Mg), prepare a dry mixture of DEGACRYL RG S and the necessary quantity of alkaline-earth oxide, hydroxide or carbonate and stir this into warm water. The solutions thus obtained are milky white.

When carbonates are used for neutralisation, pronounced gas (CO₂) or foam development may be the result. Therefore, the DEGACRYL RG S / carbonate mixture should be added slowly.

Stock solution

Minimum concentration: We recommend preparing a stock solution with a minimum concentration of 3 % DEGACRYL RG S.

Maximum concentration: From a certain concentration upwards the stock solutions acquire a pasty consistency and are then difficult to process.

This maximum concentration depends on the type of DEGACRYL RG S used, on the neutralising agent and the degree of neutralisation.

The following concentrations are recommended for stock solutions containing NaOH as a base:

DEGACRYL RG S hv approx. 5 wt.-%
 DEGACRYL RG S mv approx. 10 wt.-%

These stock solutions can be mixed with each other.

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Preparing dilute aqueous solutions from stock solutions

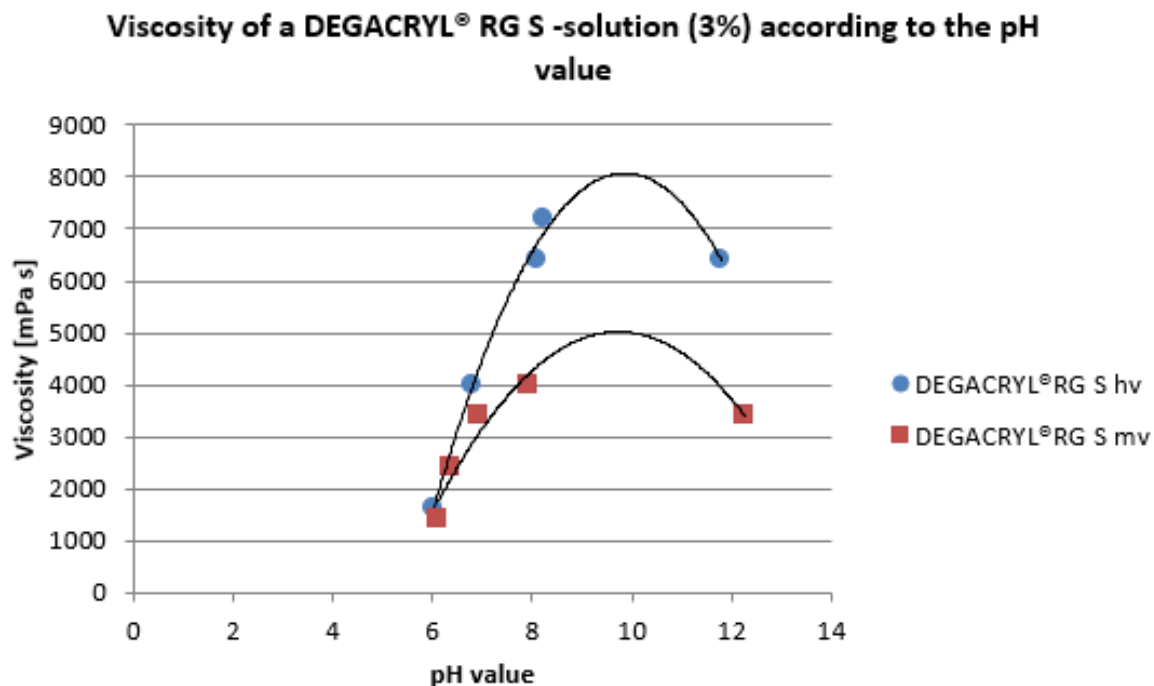
Stock solutions can be converted to DEGACRYL RG S solutions of any desired concentration by adding water and homogenising.

If acids are added, DEGACRYL RG S precipitates at pH values below 4.5.

DEGACRYL RG S salts are solutions of anionic polyelectrolytes incompatible with cationic polyelectrolytes.

pH of the solutions

The solutions prepared with the stated amounts of base are weakly alkaline. Reducing these amounts leads to neutral to weakly acidic solutions.

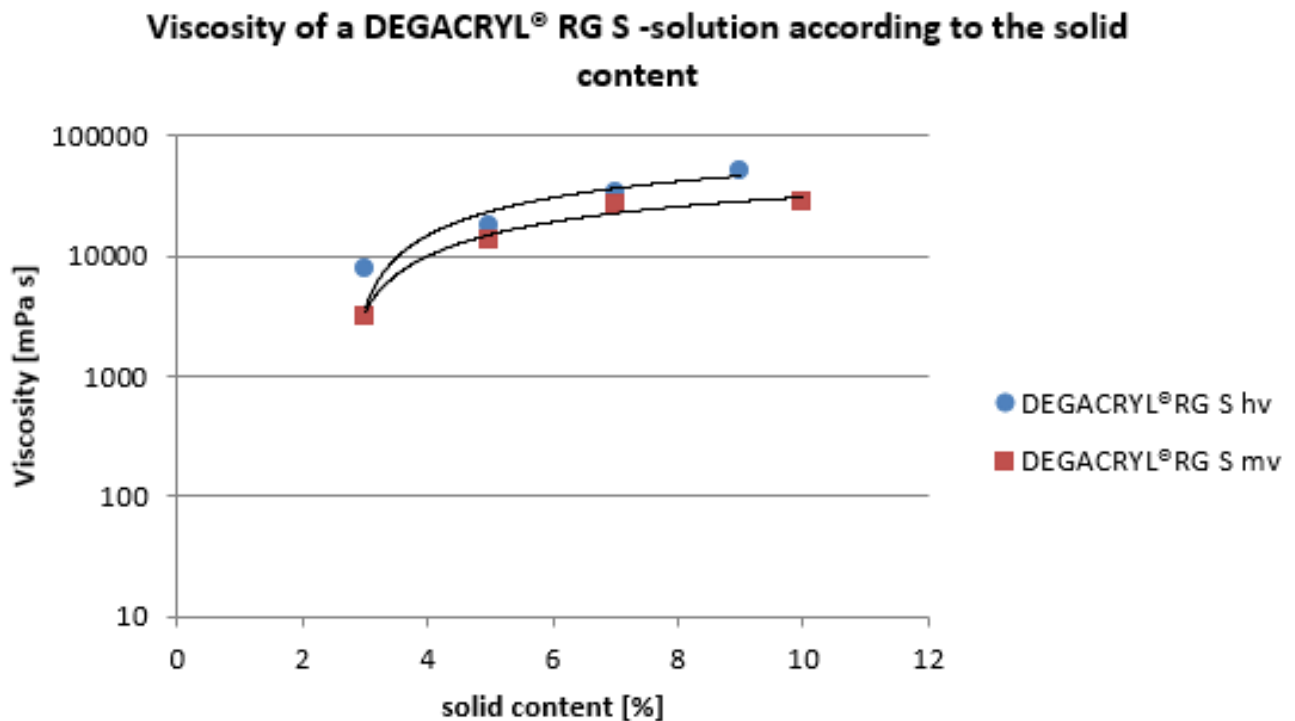


Viscosity

The viscosity of aqueous solutions depends on the solids content, the temperature, the degree of neutralisation and the type of base used for neutralisation.

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Triethanolamine provides the highest solution viscosities. Compared with sodium hydroxide, ammonia gives the lower-viscosity solutions. Excess bases and foreign electrolytes reduce the viscosity.

Preparing aqueous alcoholic solutions from aqueous stock solutions

The procedure is the same as for aqueous solutions:

After suspending DEGACRYL RG S in water at approx. 60°C and letting it swell, neutralisation is performed with, preferably, triethanolamine. After cooling, methanol, ethanol or isopropyl alcohol can be added.

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Alcoholic aqueous solutions

ROHAGIT S as supplied may also be dissolved directly in methanol or a mixture of water and ethyl resp. isopropyl alcohol (ratio 1:1). However, in this case its function as thickening agent is limited.

The maximum solids contents are

- 5 % for DEGACRYL RG S hv
- 7 % for DEGACRYL RG S mv

Typical properties are approximate reference values. If you need product specifications please contact us.

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