

DEGACRYL® RG S 3

Alkali-soluble methacrylic acid copolymer in powder form

Typical Properties

Property	Value (approx.)	Unit	Method
Physical form	fine powder		
Ionic character	anionic		
Solubility	alkali-soluble		
Solids content	95 ± 5	%	
Powder density	555	g/l	
Acid value	415 - 465	mg	KOH/g

Properties of the solution

Viscosity at 20°C (Brookfield viscometer, LVT, spindle III / 6 rpm)	20% DEGACRYL® RG S 3 solution as an ammonium salt 1.100 - 1.700 mPas
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Handling

Avoid dust formation!

General remarks

Packaging	paper bags with PE lining (20 kg)
Storage	In the absence of moisture, product keeps for 3 years / from date of delivery

Film properties

The film properties of the salts of DEGACRYL® RG S 3 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 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.

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Applications

The salts of DEGACRYL® RG S 3 with alkalis, ammonia and organic amines in the form of their aqueous solutions are suitable for many technical purposes. They serve as stabilisers, emulsifiers, dispersing and finishing agents as well as bonding and thickening agent.

Hints for processing

Preparation of aqueous solutions: DEGACRYL® RG S 3 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 aminomethyl-propanol, are also suitable as neutralising agents.

Viscosity: The viscosity of aqueous solutions depends on the solids content, the temperature, the degree of neutralisation and the type and quantity of base used for neutralisation. Triethanol-amine provides the highest solution viscosities. Ammonia gives solutions of lower viscosity than sodium hydroxide. Excess bases and foreign electrolytes reduce the viscosity.

Neutralisation

To neutralise 1 kg of DEGACRYL® RG S 3 (100 % solids), for example

328 g sodium hydroxide or
 460 g potassium hydroxide
 590 g ammonia (25% aqueous solution)
 1223 g triethanolamine
 731 g aminomethylpropanol

are required.

The quantities are calculated according to the following formula:

$$M = \frac{MB \times 8.20}{WB}$$

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

Stock solution

From a certain concentration upwards the stock solutions acquire a pasty consistency and are then difficult to process. This maximum concentration depends on the neutralising agent and the degree of neutralisation. We recommend preparing a stock solution of the ammonium salt with a concentration of 20% DEGACRYL® RG S 3.

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Procedure

Proceed as follows to prepare a 20 % DEGACRYL® RG S 3 ammonium salt solution:

Suspend 176 g DEGACRYL® RG S 3 in 500 g water with stirring and heat to 60 - 80 °C. Allow 5 to 10 minutes for swelling. Then stir in the required amount of base until a pH value of 9.5 is reached. This requires approx. 150 ml of 25% ammonia solution. Add more water to obtain a total quantity of 1,000 g. Continue stirring until DEGACRYL® RG S 3 is completely dissolved.

The DEGACRYL® RG S 3 solution is turbid and of orange-brown colour.

Preparing dilute aqueous solutions from stock solutions

Stock solutions can be converted to DEGACRYL® RG S 3 solutions of any desired concentration by adding water and homogenising.

Properties of dilute aqueous solutions

If acids are added, DEGACRYL® RG S 3 precipitates at pH values below 4.5.

DEGACRYL® RG S 3 salts are solutions of anionic polyelectrolytes incompatible with cationic polyelectrolytes.

Hints for application

DEGACRYL® RG S 3 is used as an emulsifier to prepare aqueous paraffin emulsions. We recommend the following preparation:

DEGACRYL® RG S 3 is stirred into the given quantity of town water at 70 °C. After a swelling period of approx. 10 minutes, ammonia is added and stirred for 15 minutes until DEGACRYL® RG S 3 is completely dissolved. Melted paraffin is slowly added to this solution, with vigorous stirring, over a period of 20 minutes and subsequently stirred for another 30 minutes. After adding a preservative, e.g. N,N dimethyl acetamide can be added for a lower viscosity.

The emulsion should be filled into containers whilst still hot.

For 100 kg:

40.62 kg water

(up to) 10.10 kg DEGACRYL® RG S 3

6.40 kg Ammonia, 25 %

38.10 kg paraffin

0.02 kg preservative, e.g. Proxel GXL from ICI (20 % solution)

4.76 kg N,N dimethyl acetamide (optional)

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

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