

Ultrasound Gel

This ultrasound gel features **Carbopol® 980 NF polymer**, which imparts viscosity and clarity to the formulation. It is intended to be used with medical ultrasound equipment to reduce the impedance between the electrode surface and the skin. The gel can easily be removed from the skin after use.

Number	Ingredients	% w/w
	Part A:	
1.	Carbopol® 980 NF polymer	0.85
2.	Deionized water	67.0
	Part B:	
3.	Sodium carboxymethylcellulose (Aqualon® CMC-9M31F PH)	0.20
4.	Propylene glycol	10.0
5.	Deionized water	10.0
	Part C:	
6.	Disodium EDTA	0.05
7.	Sodium methylparaben	0.20
8.	Sodium propylparaben	0.20
9.	Deionized water	8.00
	Part D:	
10.	Sodium hydroxide (as 18% Solution)	q.s. to pH 7.0
11.	Deionized water	q.s. to 100.00
	TOTAL:	100.00

Lab batch size - 600 g

Process:

- 1. Part A (Carbopol® polymer dispersion phase):** Add purified water in a vessel equipped with dispersing type or propeller type impeller. Disperse Carbopol® 980 NF polymer into the water by submerging the impeller until it is very close to the bottom of the vessel. Angle the impeller to generate a vortex that is 1 to 1½ impeller diameters. Slowly sift the polymer through a stainless steel 20 mesh screen into the vortex of the rapidly agitating liquid (about 800-1500 rpm). Increase the agitation as the viscosity of the dispersion increases to maintain a vortex. After all the dry polymer has been introduced, reduce the agitation to 400-600 rpm and reposition the mixer to vertical position to avoid or minimize air entrapment. Continue the agitation for about 45 minutes, or until a uniform dispersion is attained.
- 2. Part B:** Disperse sodium carboxymethylcellulose in propylene glycol, add water and mix thoroughly until a clear, viscous solution is obtained.
- 3.** Add Part B ingredients to Part A ingredients and mix thoroughly.
- 4. Part C:** Dissolve disodium EDTA and sodium parabens in water and add this salt solution into the Part A + B mixture.
- 5. Part D:** Neutralize the above mixture with 18% sodium hydroxide solution and adjust to weight with deionized water. Mix it thoroughly with Paddle or S/U-shaped low-shear impeller to minimize the air entrapment and to obtain a clear viscous gel.

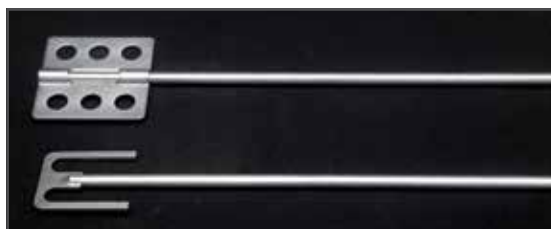
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Product Properties	Stability
Appearance: Clear Gel	Passed 3 freeze/thaw cycles
pH: 7.00	Stable for a minimum of 6 months when stored under the following ICH conditions: Long term (25 ± 2°C / 60 ± 5% relative humidity)
Viscosity (cP)*: 28,467 • *Brookfield RVT @25°C, 20 rpm, Spindle #6, measured at 24 hours	Accelerated (40 ± 2°C / 75 ± 5% relative humidity)

Design of mixing elements:



Propeller or dissolver for dispersing Carbopol® polymers.



Paddle or U-shaped low-shear impeller for neutralization.

Summary:

Carbopol® polymers have demonstrated to be useful and highly efficient as rheology modifiers to obtain a crystal-clear viscous topical gel to provide conductivity, lubricity, adhesion, and easy to remove properties.

An alternative Lubrizol product to use in this formulation is Carbopol® Ultrez 10 NF or ETD 2020 NF polymer which allows for versatility in formulating and processing because it is easy to disperse in water.

The Lubrizol Life Science Health website www.lubrizol.com/Health provides additional information:

- Bulletin 04 - Dispersion Techniques; Bulletin 07 - Flow and Suspension Properties; Bulletin 08 - Emulsification Properties; Bulletin 21 - Formulating Semisolid Products
- Dispersion and neutralization videos under video gallery
- Technical Data Sheets, Test Procedures, Certificates, and other Formulations

Please contact your Lubrizol representative to get samples, quotations or further technical assistance.

