



Balance[®] CR polymer

Low VOC hair fixative

INCI: Acrylates Copolymer

Balance CR polymer is an acrylate emulsion resin designed for low VOC aerosol systems. Whether you need low VOC to comply with local regulations or to reduce cost, Balance CR polymer can provide you with excellent hold and formulation latitude.

Recommended applications

Balance CR polymer was primarily designed as a hair fixative for aerosol hair spray systems. The polymer has been developed to provide hard holding performance and clear films from high water systems. Balance CR polymer uses our low corrosion technology, which reduces the level of corrosion that is typically associated with emulsion polymers.

Features and benefits

- Formulations from 80% to 0% VOC aerosol and pump hair sprays
- Excellent spray characteristics
- Strong hold
- Long term formulation stability
- Useful for styling aids such as fixative mousses, styling creams, and setting lotions

Suggested use levels, as supplied

Application	% active
Hair spray formulations	4-18%, depending on hold level
Styling aids such as creams, lotions and mousses	1-10

Formulation guidelines

Balance CR polymer can be used in a wide variety of formulations and solids levels. Typically it is used from 2 to 8% (dry basis) in aerosol hair sprays. Specific levels will depend on the properties that are desired in the final hair spray product.

Neutralization

Balance CR polymer is a carboxylated polymer with an acidity, on a dry basis, of approximately 1.50 meq/g. To fully optimize its performance properties, Balance CR polymer must be neutralized to 95-100% with AMP. The final formulation pH of a Balance CR polymer containing hair spray should fall within a pH range of 8.5-9.0.

While AMP (2-amino-2methyl-1-propanol) is the neutralizing agent of choice, other agents may be used effectively including AMPD (2-amino-2-methyl-1, 3-propanediol), mono-isopropanolamine and tri-isopropanolamine. In addition, inorganic bases such as sodium and potassium hydroxide may be used. The use of inorganic neutralization agents has shown improved stiffness, hold, and humidity resistance.

The use of inorganic neutralization agents has shown improved stiffness, hold, and humidity resistance. The amount of base needed to neutralize the carboxyl groups in Balance CR polymer can be determined by the following relationships:

$$\text{Parts by weight (g) of base required} = \frac{W * A * N * E * S}{1000}$$

Where:

W = parts by weight (g) of Balance CR polymer used

A = acidity (meq/g) of Balance CR polymer

N = % neutralization required (decimal)

E = equivalent weight of base used

S = percentage solids (expressed as a decimal) of Balance CR polymer

A specific example of a 95% neutralization of 100 grams of Balance CR polymer with AMP using this relationship is shown:

W = 100 grams

A = 1.5 meq/g

N = 0.95

E = 89 meq/g

S = 0.45 (45% solids)

$$\text{Grams of AMP 100} = \frac{100 \times 0.45 \times 1.50 \times 89 \times 0.95}{1000} = 5.71$$

Note: Depending upon the polymer used, it may be necessary in quality control to consider the alkalinity of the polymer in titrations to determine percent neutralization. Contact us for further information and procedures.

Preparation of hair spray concentrates

For use in alcohol-free, 55% VOC and 80% VOC hair spray formulations, order of addition should be as follows:

- Solvents/water
- AMP (or other neutralizer)
- Balance CR polymer

The preparation of the aerosol concentrates should be carried out according to the procedure outlined in the following example:

- Charge the mixing vessel with the required amount of alcohol
- Start agitation
- Add resin slowly – so that no accumulation of resin occurs on the surface
- After all the resin is added, slowly add the neutralizing agent (if KOH, add as 10% solution in alcohol)*
- Continue mixing until all the resin is in solution
- Add the rest of the ingredients in the formulation
- Filter the concentrate down through 5-10 micron cartridge filters before filling the aerosol containers

* Alcohol temperature dramatically affects solution rate. It is generally suggested that alcohol temperature be 15-20°C. Concentrates of up to 20% neutralized resin in alcohol may be prepared. Care should be taken that the viscosity of the concentrate is suited to the aerosol packing machinery involved.





Compatibility

Balance CR polymer can be blended with others of our resins to tailor the formulation to your needs. If more stiffness and hold are desired, then blends with Amphomer® polymer family or Resyn® 28-2930 polymer can be made.

Performance properties

Balance CR polymer offers a decided advantage over other available low VOC fixatives because it was designed to be readily removable by shampoo. Its formulation pH, as well as its hydrophobic/hydrophilic balance and molecular weight contribute to this superior performance.

Storage and handling

- Standard conditions
- Protect from freezing
- Keep containers sealed to prevent dirt and dust pick-up

Health and safety

Information on Balance CR polymer relating to the EU Cosmetics Directive 76/768/EEC is available on request.

Contact us directly for detailed product
information and sample request
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email | PersonalCare.Marketing@nouryon.com

Nouryon

Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of more than 7,900 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands. Visit our website and follow us @Nouryon and on LinkedIn.

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