



Balance® Extra polymer

Concentrated low VOC hair fixative

INCI: Acrylates Copolymer

Balance® Extra polymer is a high molecular weight acrylate film forming polymer that is designed for low VOC aerosol systems and hair gel formulations. It can be utilized across the hair styling segment from hair gels to aerosol hairsprays to deliver stiffness and hard hold in humidity conditions.

Recommended applications

- Aerosol hair spray
- Hair gels
- Mousses
- Waxes
- Pomades

Balance® Extra polymer was primarily designed as a hair fixative for the concentrated low VOC aerosol hair spray systems. The polymer functions across all styling applications to deliver hard holding films. Balance® Extra polymer uses our low corrosion technology, which reduces the level of corrosion typically associated with emulsion polymers in high water aerosols. In addition, Balance® Extra polymer is supplied as a 45% active liquid which is preservative free.

Features and benefits

- Effective in formulations from 80% VOC to 0% VOC aerosol pump sprays, mousses and gels
- Excellent hold properties across all applications
- Excellent spray properties
- Long term formulation stability
- Preservative free

Suggested use levels, as supplied

Application	% active
Hair spray formulations	0.5-5%, depending on hold level
Styling aids such as gels, mousses, waxes and pomades	0.5-18%, depending on hold level (Balance® Extra polymer is compatible with many Hydrophobic Alkali Swellable Emulsions (HASE) type polymers)

Formulation guidelines

Balance® Extra polymer can be used in a wide variety of formulations and solids levels. Typically it is used from 1-3% (dry basis) in aerosol hair sprays. Specific levels will depend on the properties that are desired in the final hair spray product.

In hair gels Balance® Extra polymer is used in combination with HASE polymers like our Balance® RCFg polymer as a rheology modifier. Balance® Extra polymer is used best at a 5-10% polymer solids level in the formulation depending on the level of hold. The polymer functions best at 100% neutralization to optimize hold and removability.

Neutralization

Balance® Extra 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® Extra polymer must be neutralized 95-100% with base. The final formulation pH of a Balance® Extra polymer containing hair spray should fall within pH range of 8.5-9.0, a hair gel can be formulated between 7-8.

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 amount of base needed to neutralize the carboxyl groups in Balance® Extra 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® Extra polymer used

A = acidity (meq/g) of Balance® Extra polymer

N = % neutralization required (decimal)

E = equivalent weight of base used

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

A specific example of a 95% neutralization of 100 grams of Balance® Extra 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)

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

Preparation of aerosol 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® Extra 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.





Polymer properties

Appearance	white emulsion
Acidity	1.4-1.6 meq/g
pH	2.0-3.5
Solid content	44-46%
Viscosity	<1000cps

Compatibility

Balance® Extra polymer can be blended with our other 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.

Storage and handling

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

Health and safety

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

Contact us directly for detailed product information and sample request
website | nouryon.com/markets/personal-care
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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