



# Bio-based polymers for advanced Personal Care solutions



## Formulation tips

An **accurate dispersion** is important not only to ensure the correct inclusion of guar into formulations, but also to deliver better performances of the finished product. Esaflor® guar derivatives are **easy to formulate**. They only need to be added into water under vigorous stirring at room temperature to be dispersed, avoiding lumps' formation. By adjusting **pH to 5.0-5.5** a rapid and full hydration of the polymer is obtained (20' stirring time is recommended). Moderate heating could reduce the hydration time. Esaflor® Zero-X, Esaflor® EC 4 and Esaflor® 4W are **self-hydrating** and don't require any pH adjustment.

**Recommended order of addition:** water, cationic guar, pH adjuster, amphoteric surfactants, non ionic surfactants, anionic surfactants, other ingredients, salt, preservative, final pH adjuster.

**Typical use level:** 0.1 – 1.0 %







## Non-ionic derivatives

| Product   | Properties             |                  |                | Performance |            | Application |             |               |                           |           |                     | Key features  |
|---|------------------------|------------------|----------------|-------------|------------|-------------|-------------|---------------|---------------------------|-----------|---------------------|---|
|   | Degree of modification | Molecular weight | Dissolution    | Suspending  | Thickening | Shampoo     | Conditioner | Body cleanser | Hydro-alcoholic sanitiser | Deodorant | Skin & Sun emulsion |   |
| <b>INCI name: Hydroxypropyl Guar</b>                      |                        |                  |                |             |            |             |             |               |                           |           |                     |   |
| <b>Esaflor® 4W</b>  | Low                    | High             | Self-hydrating |             | ○○○        | ●●          | ●           | ●●●           | ●                         | ●         | ●                   | Excellent thickening, especially in surfactant solutions. Good compatibility with electrolytes. Smooth skin feel.                                   |
| <b>Esaflor® HDR</b>                                       | High                   | High             | Dispersible    |             | ○○○        | ●           | ●           | ●             | ●●●                       | ●●        | ●                   | Thickener with optimal compatibility with polar solvents and ethanol. Ideal for hand sanitisers with a soft skin feel.                              |
| <b>INCI name: C18-C22 Hydroxyalkyl Hydroxypropyl Guar</b> |                        |                  |                |             |            |             |             |               |                           |           |                     |   |
| <b>Esaflor® HM 22</b>                                     | Medium                 | High             | Dispersible    | ○○          | ○○○        | ●●          | ●●●         | ●●            |                           | ●●●       | ●●●                 | Emulsification-aid for O/W emulsions, with excellent thickening and stabilising properties. Good compatibility with electrolytes. Smooth skin feel. |



- low
- medium
- high
- suitable
- recommended
- highly recommended

## Cationic derivatives

| Product   | Properties             |                  |                | Performance  |            |   | Application |             |               |           |                     | Key features  |
|---|------------------------|------------------|----------------|--------------|------------|---|-------------|-------------|---------------|-----------|---------------------|---|
|   | Degree of modification | Molecular weight | Dissolution    | Conditioning | Thickening | Delivery of water-insoluble ingredients | Shampoo     | Conditioner | Body cleanser | Deodorant | Skin & Sun emulsion |   |
| INCI name: Guar Hydroxypropyltrimonium Chloride   |                        |                  |                |              |            |   |             |             |               |           |                     |   |
| <b>Esaflor® Zero-X</b>   | Medium                 | High             | Self-hydrating | ○○           | ○○         | ○○                                      | ●●●         | ●           | ●●            | ●         | ●●                  | Optimal conditioning and deposition of water-insoluble actives. Suitable for everyday-use shampoos.   |
| <b>Esaflor® Zero-XB</b>  | Medium                 | High             | Dispersible    | ○○           | ○○         | ○○                                      | ●●●         | ●           | ●●            | ●         | ●●                  | Optimal conditioning and deposition of water-insoluble actives. Suitable for everyday-use shampoos.   |
| <b>Esaflor® LIGHT</b>    | Medium                 | Low              | Dispersible    | ○            | ○          | ○                                       | ●●●         | ●           | ●●●           | ●         | ●                   | Light conditioning, ideal for volumising and conditioning shampoos. Suitable for baby shampoos or thin hair.  |
| <b>Esaflor® PLUS</b>     | High                   | High             | Dispersible    | ○○○          | ○○○        | ○○○                                     | ●●●         | ●●●         | ●●            | ●         | ●                   | Highest conditioning and deposition of water-insoluble actives. Suitable for thick, ethnic or damaged hair.   |
| <b>Esaflor® PURE</b>     | Medium                 | High             | Self-hydrating | ○○           | ○○         | ○○                                      | ●●●         | ●           | ●●            | ●         | ●                   | Developed for clear formulations. Moderate conditioning. Ideal for everyday-use shampoos.   |
| <b>Esaflor® EC 3</b>  | Medium                 | High             | Dispersible    | ○○           | ○○         | ○○                                      | ●●●         | ●           | ●●            | ●         | ●●                  | Optimal conditioning and deposition of water-insoluble actives. Suitable for everyday-use shampoos.   |
| <b>Esaflor® EC 4</b>  | Medium                 | High             | Self-hydrating | ○○           | ○○         | ○○                                      | ●●●         | ●           | ●●            | ●         | ●●                  | Self-hydrating version of Esaflor® EC 3.  |
| <b>Esaflor® EC 5</b>  | Medium                 | Low              | Dispersible    | ○            | ○          | ○                                       | ●●●         | ●           | ●●●           | ●         | ●                   | Light conditioning, ideal for volumising and conditioning shampoos. Suitable for baby shampoos or thin hair.  |
| <b>Esaflor® EC 7</b>  | High                   | High             | Dispersible    | ○○○          | ○○○        | ○○○                                     | ●●●         | ●●●         | ●●            | ●         | ●●                  | Highest conditioning and deposition of water-insoluble actives. Suitable for thick, ethnic or damaged hair.   |
| INCI name: Hydroxypropyl Guar Hydroxypropyltrimonium Chloride   |                        |                  |                |              |            |   |             |             |               |           |                     |   |
| <b>Esaflor® PFT</b>    | Medium                 | High             | Dispersible    | ○            | ○          | ○                                       | ●●●         | ●           | ●●●           |           | ●                   | Developed for clear formulations. Light conditioning, ideal for volumising and conditioning shampoos. Improved hair brightness and mildness towards skin. |
| <b>Esaflor® HC 56</b>   | Medium                 | Medium           | Dispersible    | ○            | ○          | ○                                       | ●●●         | ●           | ●●●           |           | ●                   | Opaque version of Esaflor® PFT.   |