



## Technical Data Sheet

### UCARE™ Polymer LR-400

Conditioning polymer  
INCI Name: Polyquaternium-10

#### Features & Benefits

- Substantive to hair and skin.
- Light to medium conditioning.
- Minimal build-up, enhanced volume.
- Mend split-ends.
- Can be formulated into clear shampoo systems.
- Can be formulated into opacified shampoo systems.
- Can prevent loss of moisture from the skin.
- Can moderate the defatting effects of alkaline surfactant systems.

#### Applications

- UCARE™ polymers are used in a diverse number of applications across both hair and skin care. Perhaps the most notable for the UCARE™ Polymer LR-400 is its ability to provide substantive conditioning from shampoo systems.

#### Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Viscosity, 2% aqueous solution, #2 spindle	cP	300–500
Volatiles	wt%	0–6
Nitrogen	wt%	0.80–1.10
Particle size, through 20 mesh, < 841 micron	%	95–100
Ash	wt%	0–3

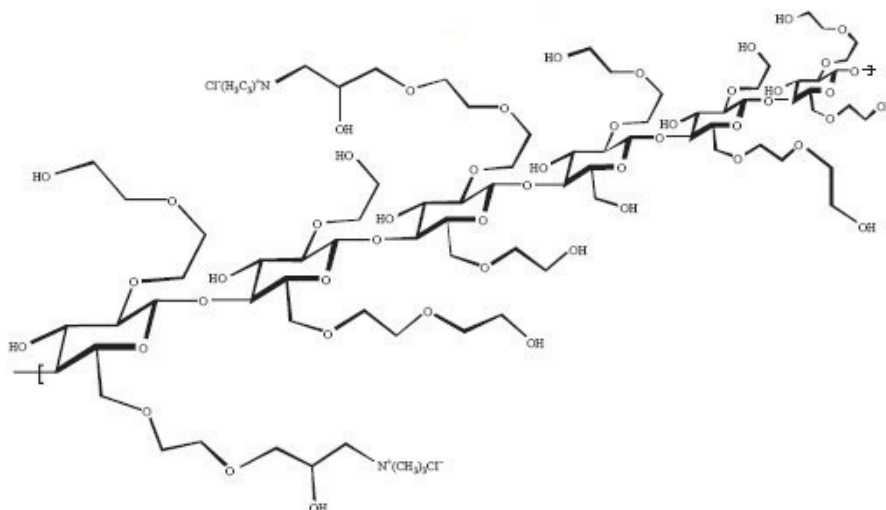
#### Description

Dow UCARE™ polymers are polymeric, quaternary ammonium salts of hydroxyethylcellulose reacted with trimethyl ammonium substituted epoxide. The cellulosic backbone is derived from natural, renewable resources.

The UCARE™ polymers are generally grouped into three categories. The LK grade has the lowest level of % Nitrogen (0.4–0.6), followed by the LR grade (0.8–1.1), and finally the JR grade (1.5–2.2). Increasing the amount of nitrogen substitution provides more substantive bonding to the hair surface and a smoother film microtexture.

## Description (Cont.)

The Idealized Structure of UCARE™ Polymers:



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## Recommended Use Level

### Recommended Applications

Shampoos, body washes, creams and lotions, hair styling products.

0.2–0.5 wt%.

## Methods of Addition

There are two basic methods for preparing UCARE™ polymers for incorporation into your formulation.

### Prior Polymer Hydration

- Hydration of the polymer is accomplished by slowly adding the dry powder into agitated room temperature water and allowing it to mix until the solution is uniform and clear.
- Hydration can be accelerated by heating the solution to 65°C.
- Once the polymer is fully hydrated, simply add the solution directly to the surfactant system blend with mixing.
- Hydration may be accomplished separately or as a first step in the manufacturing procedure.

### Addition with Co-solvents

- A slurry of the dry powder may be made in a non-aqueous, water soluble, co-solvent (such as propylene glycol, glycerin, low molecular weight CARBOWAX™, or Methyl Gluceth-10 or -20).
- The slurry can then be mixed into the water or directly into the surfactant blend.
- Hydration can be accelerated by heating the solution to 65°C.
- The co-solvent "wets" the polymer and allows it to be more easily dispersed, thus increasing the rate of hydration whether it is in the water or directly put into the surfactant blend.

**Handling  
Precautions**

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

**Usable Life and  
Storage**

Store in a dry place. Protect from atmospheric moisture. Avoid prolonged exposure to heat and air.

**Limitations**

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

**Health and  
Environmental  
Information**

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, [dow.com](http://dow.com) or consult your local Dow representative.

**Disposal  
Considerations**

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

**Product  
Stewardship**

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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