

Liquid Crystal System for Manufacture of Personal Care Cleansing Products

The **Liquid Crystal** System provides a simple way of producing a variety of Personal Care Cleansing Products of consistent quality. The use of one **Liquid Crystal Concentrate** plus **Conditioning Additive** allows you to efficiently and cost effectively manufacture a range of cleansing products including Shower Gels, Shampoos and Foam Baths. Pearlsed cleansing products can be produced by the addition of **Liquid Pearl**, thereby increasing the number of possible variants.

Simply dilute the **Liquid Crystal Concentrate** with water, add perfume, colour and preservative of your choice and thicken your product by adding common salt. **Liquid Crystal Concentrate** is highly active with typical use levels of around 20 to 30 %. It has good clarity and low colour. Although highly active, it has a low viscosity, making it readily pourable or pumpable. Manufacturing efficiencies are readily achievable.

Liquid Crystal Concentrate is a careful blend of anionic and non-ionic surfactants with foam boosters and stabilisers, together with skin and hair conditioning agents that have a long history of use in Personal Care Cleansing Products. It is balanced to neutral pH and will produce copious amounts of dense, creamy lather that can be rinsed away easily and completely.

By adjusting the quantity of **Liquid Crystal Concentrate** and the addition of **Conditioning Additive** and **Liquid Pearl**, at various percentages, several different products can be produced with different characteristics and levels of cost effectiveness.

Liquid Crystal Concentrate Ingredient Listing

INCI Name	Function	% w/w
Aqua	Water (diluent)	25 - 50%
Sodium laureth sulfate	Surfactant for cleansing and foaming.	25 - 50%
Propylene glycol	Humectant and modifying viscosity.	0.2 — 5%
Sodium chloride	Modifying viscosity	0.2 — 5%
Cocamine oxide	Surfactant for modifying lather and conditioning.	0.2 — 5%
Cocamidopropyl betaine	Surfactant for modifying lather and mildness.	0.2 — 5%
Citric acid	For modifying the pH	0.2 — 5%
Polyquaternium-7	Conditioning of hair & skin	<1.0%
Methylchloroisothiazoline, Methylisothiazolinone,	Preservative System	<0.1% (9ppm total)
Magnesium chloride, Magnesium nitrate		active ingredients

Formulation & Manufacturing Guidelines

The following formulations are suggested guidelines for production of quality products of medium cost effectiveness and should be tested for stability and packaging compatibility.

Standard Foam Bath

<u>Ingredient</u>	<u>% w/w</u>
1. Water	
2. Liquid Crystal Concentrate	25
<i>Mix well between additions (See manufacturing tips).</i>	
3. Preservative(See manufacturing tips).	as required
4. Liquid Pearl (if required)	1.2
5. Perfume	1.0
Adjust pH if required (See manufacturing tips).	
6. Colour (See manufacturing tips).	as required
7. Salt	* as required

* Common salt should be added in small amounts to increase viscosity. Trials will be needed to establish the correct amount to add.

Do not add too much salt or the product will go cloudy!

Liquid Crystal Concentrate is not designed to be used undiluted. It should be diluted as per the guidelines; otherwise in its undiluted form it may cause skin irritation

Standard Shower Gel

<u>Ingredient</u>	% w/w
1. Water	
2. Liquid Crystal Concentrate	25
<i>Mix well between additions (See manufacturing tips).</i>	
3. Preservative(See manufacturing tips).	as required
4. Liquid Pearl (if required)	1.2
5. Conditioning Additive	0.1
6. Perfume	1.0
7.Colour (see manufacturing tips)	* as required
8.Salt	* as required

Standard Shampoo

<u>Ingredient</u>	% w/w
1. Water	
2. Liquid Crystal Concentrate	25
<i>Mix well between additions (See manufacturing tips).</i>	
3. Preservative(See manufacturing tips).	as required
4. Liquid Pearl (if required)	1.2
5. Conditioning additive	0.2
6. Perfume	1.0
7. Colour (See manufacturing tips).	as required
8. Salt	*as required

Manufacturing Tips

Adding and Mixing the Liquid Crystal Concentrate and Other Ingredients

Add the water into the manufacturing vessel and turn on your stirrers. While stirring, slowly pour the Liquid Crystal Concentrate and mix until it completely dissolves. Take a sample and check it is free from gel-like lumps and looks clear. Conditioning Additive, Liquid Pearl, Colour and Fragrance should be added before thickening with salt. Ensure you mix well between additions.

If warm water is available, then use at 30-40°C to speed up manufacture, by enabling the Liquid Crystal Concentrate and other ingredients such as fragrance to dissolve and clear faster.

Take care with the speed of stirring as it should be sufficient to thoroughly dissolve the liquid crystal concentrate and other ingredients but not too quick to produce copious amounts of froth.

Preservation

Liquid Crystal Concentrate contains a preservative to protect it from microbial contamination, however once diluted, this *may* not be sufficient.

All water-based personal care cleansers including Shower Gels, Shampoos and Bubble Baths are susceptible to microbial contamination, due to the types of ingredients used and the large amount of water that is added to the formulation. Many natural ingredients have a high microbial count or can be a source for microbial growth once incorporated into your formulation, so it is suggested that their concentration is kept as low as possible and/or extra preservative is added.

It is advisable to add the preservative early on in the manufacturing process. Some preservatives, however, are sensitive to pH and if this is the case then add preservative after pH adjustment.

High standards of hygiene and good manufacturing practice should be used. It is suggested that purified water is used to help reduce the risk of microbial contamination. If a water purification system is not available it is suggested that the water be boiled first and allowed to cool to 50°C before use.

Fragrances

When adding fragrance, ensure that the fragrance is completely dissolved and the product is clear before adding colour or salt. It is much easier to dissolve high concentrations of fragrance if warm water is used for the dilutions.

Your choice of fragrance can affect your product in several ways and can cause instability problems. Fragrances may affect the viscosity of the finished product. Many Fragrances may thicken the finished product but some may cause thinning. Fragrances can also cause discolouration immediately or over time.

Colours

Colour should be added once the fragrance has been added and your product clears. Once your colour has been thoroughly stirred in and your product is homogenous, then the salt can be added. It is easier to evenly distribute your colour throughout your shower gel before thickening with salt.

Water soluble dyes approved for use in cosmetic formulations should be used.

Adjusting pH

Liquid Crystal Concentrate is supplied at approximately neutral pH and adjustment of pH to your diluted product is not required. If you wish to adjust the pH of your diluted product, then first carry out laboratory trials.

Please note that modifying the pH can modify the viscosity, so adjust pH before thickening by salt addition.

Thickening Your Cleansing Product

Sodium chloride (common salt) should be used to thicken your diluted cleansing product. Typically you may require around 1-2% of salt however, Laboratory trials are needed to establish how much is required for each formulation, as different ingredients such as fragrances will affect the viscosity and subsequently will affect the required amount of salt

It is suggested that you take a 500g sample of your diluted shower gel and stir in a small amount of salt e.g. 0.5 to 1g and continue adding (e.g. 0.5 to 1 g) until it thickens sufficiently. Wait for the air bubbles to rise to the surface before checking the viscosity.

If adding salt does not sufficiently thicken your shower gel then thicker products can be made using more Liquid Crystal Concentrate in your formulation. If more Liquid Crystal Concentrate is used, less salt will be needed to thicken the final product.

Thickening An Over-Salted Cleansing Product

If too much salt is added accidentally and a thin cloudy product has resulted the product can be recovered as follows:

1. Add more water to the cloudy product, a little at a time, stirring between additions until the product clears.
2. Now add small amounts of Liquid Crystal Concentrate until the required thickness is achieved.

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