



Spec-Chem Ind.

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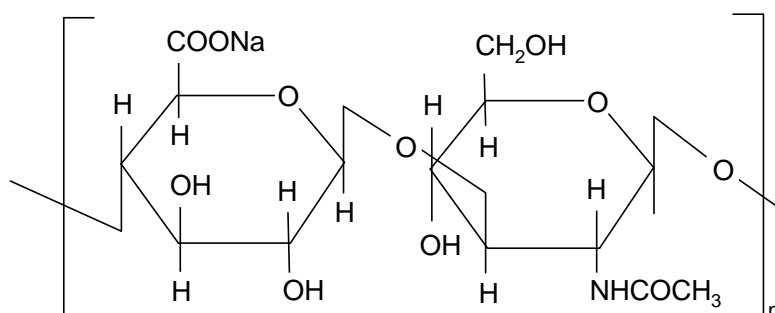
Sodium Hyaluronate

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- B. Introduction
- C. Dissolution Method
- D. Formulation
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A. Technical Data Sheet

INCI Name: Sodium Hyaluronate
Product Code: SC-7110
Chemical Name: Hyaluronic Acid, Sodium salt
CAS No.: 9067-32-7



Biological Activity

Most powerful moisturizer & humectant known so far, provides smoothness & softening to the skin, excellent anti-wrinkle effects, promotes growth of new skin cells after peelings, supports wound healing.

Cosmetic Application

Hydrating gels, moisturizing creams & lotions, anti-aging & anti-wrinkle products, pre/after sun lotions, protecting / nourishing & moisturizing skin care products, treatments for sensitive, dry skin. It can be combined with e.g. Vitamins, Collagen Protector, Lacto-Ceramide, Argireline.

Pharmaceutical Application:

sodium hyaluronate has been utilized in ophthalmic medical device (used for surgery of cataract), drug for arthritis (injection), eye drops, topical uses, and so on.

Molecular Weight Range

Sodium hyaluroante

Product Name	Molecular Weight Range
Sodium Hyaluronate HA1	Not more than 0.1×10^6 Da
Sodium hyaluronate HA7	$0.6 \sim 0.8 \times 10^6$ Da
Sodium hyaluronate HA14	$1.3 \sim 1.5 \times 10^6$ Da
Sodium hyaluronate HA16	$1.5 \sim 2.0 \times 10^6$ Da
Sodium hyaluronate HA20	Not less than 2.0×10^6 Da

1% sodium hyaluronate is also available.



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Main Specification

Cosmetic grade including powder and solution form; Pharmaceutical grade including Eye-drop and Injection grade.

Use Level

Typically used at 0.1% - 1%.

Package

100g/bottle, 1kg aluminum foil bag lined a PE bag.



B. Introduction

What does sodium hyaluronate do in the body?

Hyaluronate supports the structure of connective tissue by acting as a water magnet to maintain extracellular fluidity. HA forms a viscous fluid with exceptional lubricating properties necessary for the vital functions of many parts of the human body including the skin, heart valves, aqueous/ vitreous humor of the eye and synovial fluid (joint lubricant). The skin contains over 50% of the bodies HA. Considering that skin is over 70% water and renews itself more readily than most other bodily tissues HA is absolutely vital for it's structure and daily maintenance. It's constantly involved in cellular renewal and repair because of daily exposure to solar radiation, pressure, heat, trauma and wound healing.

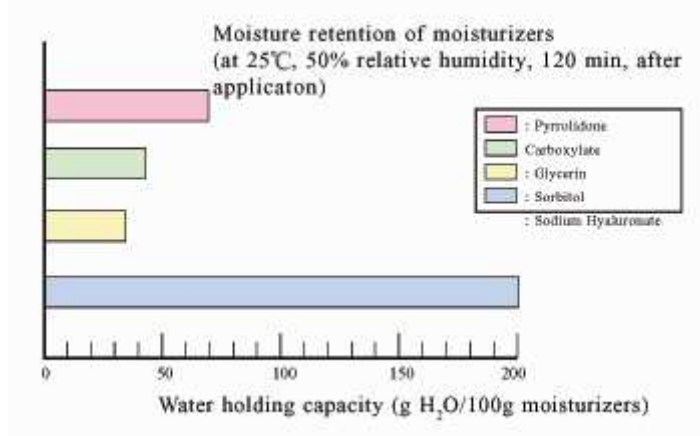
Main Functions of Sodium Hyaluronate

1. Moisturizing

HA holds more water than any other molecule in the body and is necessary to keep collagen hydrated and youthful.

1) Water holding capacity

The water holding capacity of sodium hyaluronate is extremely high compared to other moisturizers as shown below:



2) Water retention

The chart below illustrates that the moisture evaporation rate constant of sodium hyaluronate is less than that of other moisturizers. This indicates that it possesses strong water retention properties.

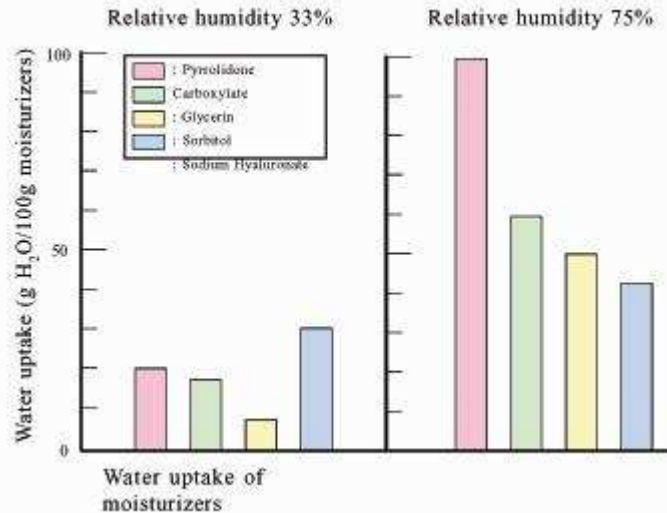
Moisture evaporation rate constant of moisturizer solutions

Sample	Moisture evaporation rate constant (min ⁻¹)
Sodium hyaluronate	$8.0 \pm 0.1 \times 100^{-2}$
Pyrrolidone Carboxylate	$9.7 \pm 0.1 \times 100^{-2}$
Glycerin	$9.8 \pm 0.2 \times 100^{-2}$
Sorbitol	$9.8 \pm 0.2 \times 100^{-2}$
Distilled water (reference)	$10.0 \pm 0.2 \times 100^{-2}$



3) Water uptake (hygroscopic property)

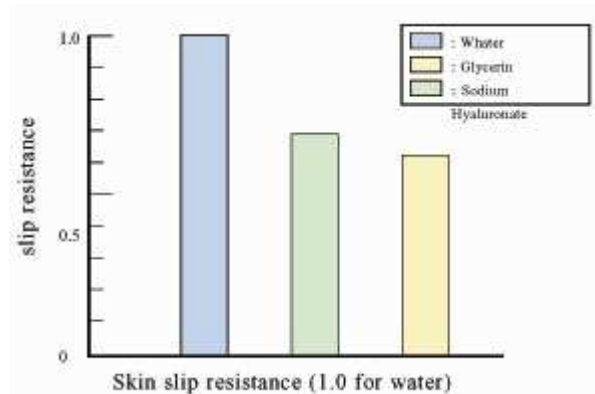
At low humidity (33%), sodium hyalurate has the highest moisture absorbing ability. While at high humidity (75%), it is the lowest.



2. Lubrication and film formation

Sodium hyalurate is a high molecular weight polymer with strong lubricating and filming. When it is smeared on the skin it can form a film and make the skin feel lubricating. Film formed on the surface of the hair can moisturize and lubricate the hair and eliminate static electricity. The hair becomes soft and easy to comb.

Sodium hyaluronate's low skin slip resistance maintains excellent skin lubricity (1.0 for water)



3. Injured-skin repairing and preventing

- 1) Accelerate the skin regeneration of injury by promoting proliferation and division of cuticle cells, and clear away oxygen free radical.
- 2) When formulated with EGF and Heparin, it can accelerate the regeneration of cuticle cells, keep skin delicate, smooth and elastic.
- 3) Prevent skin from being injured, relieve pain and accelerate wound healing of scald and burn. Low molecular weight sodium hyalurate is significant helpful for the healing of erythema and trauma on the skin.



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4. Nutrition

Low molecular weight sodium hyalurate can reach the corium layer so as to improving the content of water, nourishing skin and expanding blood capillary, improving microcirculation and promoting absorption of nutriment. So the skin will be smooth, elastic and not easy to age.

Product characteristic

Safety

- 1) Acute oral toxicity to rat: LD₅₀ > 2000mg/Kg.BW, belong to low toxic.
- 2) Acute exposure toxicity to cavy: LD₅₀ (24 hours) >2000mg/Kg.BW, belong to low toxic.
- 3) Acute dermal irritation: no irritation.
- 4) Acute eye irritation to rat: no irritation.

Molecular Weight

We have a few different molecular weights available for the powder as well as the 1% solution.

Powder type

Product Name	Molecular Weight
Sodium Hyaluronate HA1	$\leq 0.1 \times 10^6$ Da
Sodium hyaluronate HA7	$0.6 \sim 0.8 \times 10^6$ Da
Sodium hyaluronate HA14	$1.3 \sim 1.5 \times 10^6$ Da
Sodium hyaluronate HA16	$1.5 \sim 2.0 \times 10^6$ Da
Sodium hyaluronate HA20	$\geq 2.0 \times 10^6$ Da

Specifications of sodium hyaluronate

Hyaluronic Acid (Sodium Salt)

Items	Standards	Methods
Appearance	White, fine powder, slight odor	
D-glucuronic Acid	$\geq 42\%$	Bitter-Muir method
Transparency	$\geq 98\%$ (0.1% solution)	Spectrophotometer method
Molecular weight	$\geq 2.0 \times 10^6$ Da	CP (Chinese pharmacopeia)
Protein	$\leq 0.1\%$	Dye binding method
PH (0.1% solution)	5.5~7.5	CP
Loss on drying	$\leq 10\%$	Dry at 105°C till constant weight
Heavy metal (as Pb)	$\leq 2 \times 10^{-5}$ g/g	CP
Total amount of Bacteria	≤ 10 count/g	CP
Pyocyanine	None	CP



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Sodium Hyaluronate 1.0% Solution

Items	Standards
Appearance	Colorless, transparent liquid
D-glucuronic Acid	≥4mg/mL
Protein	≤0.002%
pH	4~7
Transparency	≥97%
Heavy metals	≤2 ppm
Total amount of Bacteria	≤10 count/g
<i>Staphylococcus aureus</i>	Negative
<i>Pseudomonas aeruginosa</i>	Negative

Applications in cosmetics

HA is a high effective moisturizer and nutrient functional additive in cosmetic. Its application in cosmetics is as follows:

Product	Recommended dose
1.skin cleansing product	
Face cleaning milk	0.05—0.3%
Shower lotion	0.05—0.3%
2.skin care product	
Cosmetic lotion	0.05—0.3%
Moisturizing oil	0.05—0.5%
Skin care cream	0.05—0.5%
Moisturizing milk	0.05—0.5%
3.skin nutrient product	
High moisture cosmetic	0.1—1.0%
Preventing ageing cosmetic	0.05—0.5%
Beauty and whitening cosmetic	0.05—0.3%
4. Special cosmetic	
Sun—proof cosmetic	0.05—0.5%

Packaging and storage

1) Packaging: HA 50g/bottle, 100g/bottle

2) Storage:

Keep in low temperature (4℃) or atmospheric temperature (25℃) and dry place; protect from light and seal up.

3) Shelf life:

Keep in atmospheric temperature (25℃), the shelf life is two years.

Keep in 4℃, the shelf life is five years.



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C. Dissolution Method

1. HA has excellent compatibility. It can be added into nearly every kind of cosmetics which contain water. It is normal that the dissolution process is relatively slow because of its high molecular weight and viscosity. The higher the molecular weight and density is the slower the speed of dissolution will be. The suggestion is to heat while dissolving, and the concentration is 0.5-1.0%. Heat up the water to 60-80°C, then put in the powder of HA slowly with rapid stirring. Pay attention not to make it turn to solid because of its viscosity. The speed of adding powder makes great effect on the speed of dissolution. So it is necessary to spend much time on making the powder dispersed fully and evenly, for it can improve the dissolving speed. The way of stirring is also important to the dispersion of the powder. Please make sure that the stirring can make the solution welter to rapids. Especially when adding the powder, adequate stirring can save time. Commonly, it takes 20-60 min. Making of 1% HA solution is out of question. However, try to clean up the bottle with solvent when use, and to prevent from waste.
2. Or to add appropriate glycerin to the containers, make the HA solution dissolved sufficiently by shaking and stirring, then put water (60-80°C) into the container during stirring. It can improve the dissolving speed and prevent the powder from being blown up.
3. In practical production, we suggest our customers fetch other container and put HA into glycerin, propylene, or 1,3 glycol buanediol of partial or all of the formular dosage. Agitating and immersing sufficiently, put it into the water phase tank, then it will dissolve completely while the temperature gets higher. In this way, it dose not solidify or fly and can save time.

NOTES

1. Use pure or distilled water to dissolve to guarantee the fine transparency.
2. HA is a kind of biological polysaccharide. It is better to be used up once be dissolved. If there is much left, please store it with preservative to avoid microbial pollution.
3. HA should not be used together with cationic emulgator or cationic preservative at the same time. Failure to do so may result in turbid or precipitate.
4. HA is very hygroscopic, so it should be stored airtightly in a dry and low temperature (2-10°C) place.



D. Formulation

1. ANTI-ACNE ESSENCE

SC-GF004

Trade Name	Chemical Name	Dosage %	Supplier
Water	Aqua	92.90	
1,3-Butylenglykol	Butylene Glycol	3.00	Merck
Edeta BD	Disodium EDTA	0.10	BASF
SC-7110	Hyaluronic Acid (1 %)	2.00	SC
SC-QD365	Capryloyl Salicylic Acid, Tocopheryl phosphate, Oxymatrine, Capryloyl Glycin and Vitamin B6.	1.50	SC
GERMAL L IS-45	Propylene Glycol, Diazolidinyl Urea, Methyparaben, Iodopropynyl Butylcarbamate	0.50	ISP

2. ANTI-FRECKLE LOTION (O/W)

SC-GF002

	Trade Name	Chemical Name	Dosage %	Supplier
A	Brij 72	Steareth-2	2.00	Uniqema
	Brij 721	Steareth-21	2.00	Uniqema
	Lanette MY	Cetearyl alcohol	0.50	Cognis
	DC200/350 cs	Dimethicone	0.50	Dow Corning
	dl-alpha-tocopheryl Acetate	Tocopheryl Acetate	1.00	DSM
	Finsolv TN	C12-15 Alkyl Benzoate	4.00	Finetex
	Cetiol SB45	Sea Butter	2.00	Cognis
	Butylated Hydroxytoluene	BHT	0.05	Merck
	Phenonip	Phenoxyethanol&Methylparaben&Ethylparaben&Butylparaben&Propylparaben&Isobutylparaben	0.80	Clariant GMBH
	SC-2141	Kojic Acid Dipalmitate	1.5	SC
B	Water	Aqua	72.60	
	Carbopol Ultrez 20	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.15	Noveon
	1,3-Butylenglykol	Butylene Glycol	3.00	Merck
	Edeta BD	Disodium EDTA	0.10	BASF



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C	Water dem.	Aqua	5.00	
	SC-2180	Arbutin	2.00	SC
D	TEA (10%)	Triethanolamine	0.80	
E	SC-7110	Hyaluronic Acid (1%)	2.00	SC

Procedure:

1. Heat part A and part B to 85°C.
2. When both the same temperature add part B to part A under agitation.
3. Add the solution of part C under agitation and homogenization. Then add part D to it under agitation.
4. Add the solution of part E under agitation at 55°C.
5. Cool down the emulsion to room temperature while stirring.

3. ANTINWRINKLE & ANTIAGING CREAM (O/W)

SC-GF003

	Trade Name	Chemical Name	Dosage %	Supplier
A	Brij 72	Steareth-2	2.00	Uniqema
	Brij 721	Steareth-21	2.00	Uniqema
	Lanette MY	Cetearyl alcohol	1.50	Cognis
	DC200/350 cs	Dimethicone	0.50	Dow Corning
	dl-alpha-tocopheryl Acetate	Tocopheryl Acetate	1.00	DSM
	Finsolv TN	C12-15 Alkyl Benzoate	4.00	Finetex
	Cetiol SB45	Sea Butter	2.00	Cognis
	Butylated Hydroxytoluene	BHT	0.05	Merck
	Phenonip	Phenoxyethanol & Methylparaben & Ethylparaben & Butylparaben & Propylparaben & Isobutylparaben	0.80	Clariant GMBH
	SC-7102	Ceramide E	0.5	SC
B	Water	Aqua	78.10	
	Carbopol Ultrez 21	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.25	Noveon
	1,3-Butylenglykol	Butylene Glycol	3.00	Merck
	Edeta BD	Disodium EDTA	0.10	BASF
C	TEA (10%)	Triethanolamine	1.20	
D	SC-7110	Hyaluronic Acid (1%)	3.00	



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Procedure:

1. Heat part A and part B to 85°C.
2. When both the same temperature add part B to part A under agitation.
3. Add the solution of part C under agitation .Then add D under agitation at 55°C.
4. Cool down the emulsion to room temperature while stirring.

4. ANTINWRINKLE & ANTIAGING CREAM(O/W)

SC-GF005

	Trade Name	Chemical Name	Dosage %	Supplier
A	Brij 72	Steareth-2	2.00	Uniqema
	Brij 721	Steareth-21	2.00	Uniqema
	Lanette MY	Cetearyl alcohol	1.50	Cognis
	DC200/350 cs	Dimethicone	0.50	Dow Corning
	dl-alpha-tocopher yl Acetate	Tocopheryl Acetate	1.00	DSM
	Finsolv TN	C12-15 Alkyl Benzoate	4.00	Finetex
	Cetiol SB45	Sea Butter	2.00	Cognis
	Butylated Hydroxytoluene	BHT	0.05	Merck
	Phenonip	Phenoxyethanol & Methylparaben & Ethylparaben & Butylparaben & Propylparaben & Isobutylparaben	0.80	Clariant GMBH
	SC-7102	Ceramide E	0.5	SC
B	Water	Aqua	77.10	
	Carbopol Ultrez 21	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.25	Noveon
	1,3-Butylenglykol	Butylene Glycol	3.00	Merck
	Edeta BD	Disodium EDTA	0.10	BASF
C	TEA (10%)	Triethanolamine	1.20	
D	SC-7110	Hyaluronic Acid (1%)	4.00	SC

Procedure:

1. Heat part A and part B to 85°C.
2. When both the same temperature add part B to part A under agitation.
3. Add the solution of part C under agitation .Then add D under agitation at 55°C.
4. Cool down the emulsion to room temperature while stirring.



5. SKIN LIGHTENING LOTION (O/W)

SC-GD002

	Trade Name	Chemical Name	Dosage %	Supplier
A	Brij 72	Steareth-2	2.00	Uniqema
	Brij 721	Steareth-21	2.00	Uniqema
	Lanette MY	Cetearyl alcohol	0.50	Cognis
	DC200/350 cs	Dimethicone	0.50	Dow Corning
	dl-alpha-tocopheryl Acetate	Tocopheryl Acetate	1.00	DSM
	Finsolv TN	C12-15 Alkyl Benzoate	4.00	Finetex
	Cetiol SB45	Sea Butter	2.00	Cognis
	Butylated Hydroxytoluene	BHT	0.05	Merck
	Phenonip	Phenoxyethanol & Methylparaben & Ethylparaben & Butylparaben & Propylparaben & Isobutylparaben	0.80	Clariant GMBH
B	Water	Aqua	74.60	
	Carbopol Ultrez 20	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.15	Noveon
	1,3-Butylenglykol	Butylene Glycol	3.00	Merck
	Edeta BD	Disodium EDTA	0.10	BASF
C	Water dem.	Aqua	5.00	
	SC-2140	Kojic Acid	1.50	SC
D	TEA (10%)	Triethanolamine	0.80	
E	SC-7110	Hyaluronic Acid (1%)	2.00	SC

Procedure:

1. Heat part A and part B to 85°C.
2. When both the same temperature add part B to part A under agitation.
3. Add the solution of part C under agitation and homogenization. Then add part D to it under agitation.
4. Add the solution of part E under agitation at 55°C.
5. Cool down the emulsion to room temperature while stirring.



6. SKIN LIGHTENING LOTION(O/W)

SC-GF001

	Trade Name	Chemical Name	Dosage %	Supplier
A	Brij 72	Steareth-2	2.00	Uniqema
	Brij 721	Steareth-21	2.00	Uniqema
	Lanette MY	Cetearyl alcohol	0.50	Cognis
	DC200/350 cs	Dimethicone	0.50	Dow Corning
	dl-alpha-tocopheryl Acetate	Tocopheryl Acetate	1.00	DSM
	Finsolv TN	C12-15 Alkyl Benzoate	4.00	Finetex
	Cetiol SB45	Sea Butter	2.00	Cognis
	Butylated Hydroxytoluene	BHT	0.05	Merck
	Phenonip	Phenoxyethanol & Methylparaben & Ethylparaben & Butylparaben & Propylparaben & Isobutylparaben	0.80	Clariant GMBH
B	Water	Aqua	74.60	
	Carbopol Ultrez 20	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.15	Noveon
	1,3-Butylenglykol	Butylene Glycol	3.00	Merck
	Edeta BD	Disodium EDTA	0.10	BASF
C	Water dem.	Aqua	5.00	
	SC-2140	Kojic Acid	1.50	SC
D	TEA (10%)	Triethanolamine	0.80	
E	SC-7110	Hyaluronic Acid (1 %)	2.00	SC

Procedure:

1. Heat part A and part B to 85°C.
2. When both the same temperature add part B to part A under agitation.
3. Add the solution of part C under agitation and homogenization. Then add part D to it under agitation.
4. Add the solution of part E under agitation at 55°C.
5. Cool down the emulsion to room temperature while stirring.



7. SKIN LIGHTENING LOTION (O/W)

SC-GD003

	Trade Name	Chemical Name	Dosage %	Supplier
A	Brij 72	Steareth-2	2.00	Uniqema
	Brij 721	Steareth-21	2.00	Uniqema
	Lanette MY	Cetearyl alcohol	0.50	Cognis
	DC200/350 cs	Dimethicone	0.50	Dow Corning
	dl-alpha-tocopheryl Acetate	Tocopheryl Acetate	1.00	DSM
	Finsolv TN	C12-15 Alkyl Benzoate	4.00	Finetex
	Cetiol SB45	Sea Butter	2.00	Cognis
	Butylated Hydroxytoluene	BHT	0.05	Merck
	Phenonip	Phenoxyethanol & Methylparaben & Ethylparaben & Butylparaben & Propylparaben & Isobutylparaben	0.80	Clariant GMBH
B	Water	Aqua	73.60	
	Carbopol Ultrez 20	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.15	Noveon
	1,3-Butylenglykol	Butylene Glycol	3.00	Merck
	Edeta BD	Disodium EDTA	0.10	BASF
C	Water dem.	Aqua	5.00	
	SC-2140	Kojic Acid	1.50	SC
D	TEA (10%)	Triethanolamine	0.80	
E	SC-7110	Hyaluronic Acid (1%)	3.00	SC

Procedure:

1. Heat part A and part B to 85°C.
2. When both the same temperature add part B to part A under agitation.
3. Add the solution of part C under agitation and homogenization. Then add part D to it under agitation.
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E. 1% Sodium Hyaluronate

1. Use method:

1% sodium hyaluronate should be added under stirring below 60°C to avoid HA degradation.

2. Storage:

Close storage in low temperature, dry and ventilated place, if it is to be stored for a long time after dissolving. A proper amount of preservative can be added in when the room temperature is over 20°C.

3. Shelf life: 1 year