Raw material exclusively for cosmetic manufacturing

KOKEN

Fourth-Generation Collagen

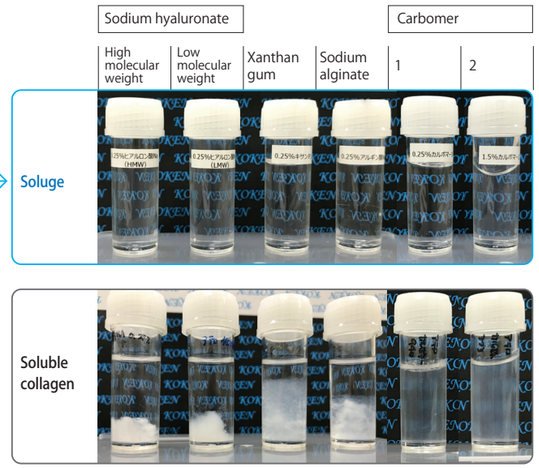
Soluge

(Atelocollagen)

Compatibility of Soluge with other materials

Soluge was mixed with each of the following cosmetic raw materials and allowed to stand at 23℃. Each mixture was stored for four weeks and changes in the appearance were observed.

Ingredient	Final concentration	Compatibility with 0.1% Soluge
Sodium hyaluronate (high molecular weight)	0.25%	○
Sodium hyaluronate (low molecular weight)	0.25%	○
Xanthan gum	0.25%	○
Sodium alginate	0.25%	○
Carbomer 1 (Carbopol 940)	0.25%	○
Carbomer 2 (Carbopol AQUA SF-1)	1.5%	○



From in-house data

While precipitates or turbidities appeared in the soluble collagen, no turbidities appeared in Soluge.

pH Stability

	Acid	Neutral	Alkaline
Soluge	◎	◎	○*
Soluble collagen	○	×	×

*Turbidity appeared at around pH 9.5.

The pH stability of Soluge avoids the solubility disadvantages of water-soluble collagen, making it useful for a wide variety of formulations.

From in-house data

Recommended amount for blending: 0.5%–1%

Safety evaluation | Human repeated insult patch test (HRIPT): Negative

Product No.	Product name	INCI name / 中文名称	Other ingredient	Package
AFN-221	Soluge 1% PE	ATELOCOLLAGEN 缺端胶原	Water/Phenoxyethanol	1 kg

The country of origin: Japan The Place of origin: Miyagi Pref.

Commitment
Focus on raw materials

Domestic sourced raw material

We selected skin from the upper lobe of the blue shark due to its high purity. The raw material originates from Kesennuma, Miyagi Prefecture.

Effective use of resources (Sustainability)

Atelocollagen is an eco-friendly cosmetic raw material made by effectively using an inedible part that is difficult to process.

Clean formulation (Buffer free)

We simplified the ingredients of atelocollagen without adding a buffer, which had conventionally been added to maintain stability.

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KOKEN CO., LTD. 1-4-14 Koraku, Bunkyo-ku, Tokyo 112-0004, Japan E-mail: customer@kokenmpc.co.jp TEL: 81-3-3816-3562 FAX: 81-3-3816-3582 www.kokenmpc.co.jp

Fourth-Generation Collagen

Soluge (Atelocollagen)

Soluge is a middle size collagen produced by harnessing technology to extract atelocollagen, a type of collagen used for medical purposes. It is a fourth-generation collagen based on the new concept of displaying the low molecular weight of hydrolyzed collagen and the high molecular weight of soluble collagen. We provide the high-quality, rare atelocollagen raw material.

History of industrial use of collagen

- First generation: Gelatin (1700s)
- Second generation: Peptide-like collagen (1930s)
- Third generation: Atelocollagen (1960s) Ultra-low-molecular/modified collagen era
- Fourth generation: Middle size molecule collagen (Soluge)

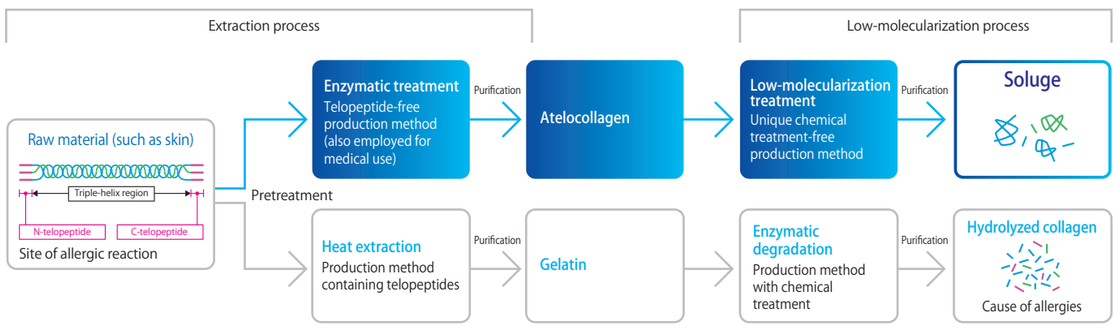
Firmness and elasticity Prevention of sagging — **Promotes collagen gel contraction**

Anti-Wrinkle — **Promotes synthesis of type I/III collagen and elastin**

Various shades (gradation) of moisturizing — **Provides double the moisture of hyaluronic acid**

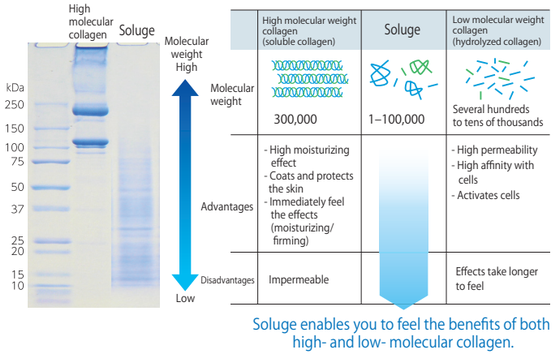
Koken's unique middle-sizing method

Soluge is a high-quality middle size molecule collagen originating from atelocollagen without telopeptides, which can trigger allergic reactions. We have successfully developed this fourth-generation collagen with various shades (gradation) using Koken's unique additive-free production method without chemical treatment.



Wide range of molecular weight

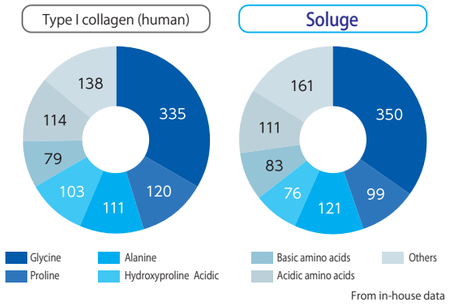
Soluge, which contains collagen with a wide range of molecular weight ranging from high to low, features characteristics of both hydrolyzed collagen and soluble collagen.



Soluge enables you to feel the benefits of both high- and low- molecular collagen.

Amino acid composition

Soluge, whose amino acid composition is similar to human skin collagen, is enriched with proline and hydroxyproline, featuring a high affinity with the skin and excellent moisture retention. Compared with other collagen derived from bovine, porcine, and tuna. Soluge is enriched with basic amino acids that are readily absorbed into the skin and hair (mainly arginine).

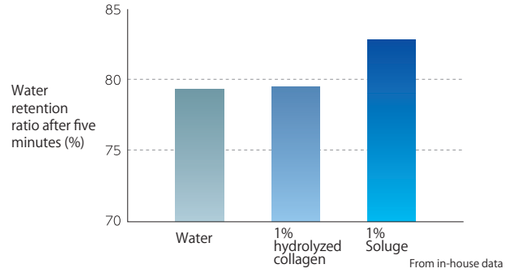


From in-house data

COLLAGEN

Water-retaining capability

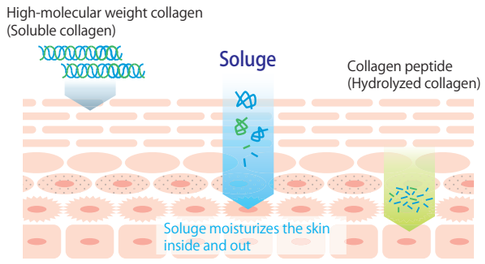
Hydrolyzed collagen (Soluge) was dripped onto a piece of filter paper. Five minutes later, the collagen in weight was determined in order to calculate the moisture retention ratio. Soluge has higher moisture retentivity than hydrolyzed collagen.



From in-house data

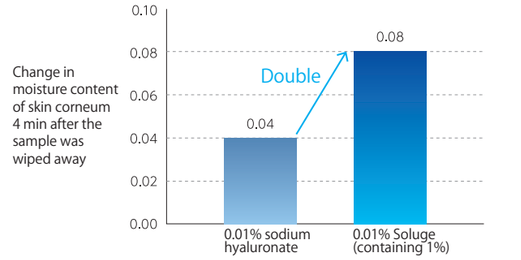
Moisturizing illustration

While conventional high-molecular weight collagen focuses on moisturizing the skin' s surface. Soluge features a gradational moisturizing function. Collagen in a wide range of sizes incrementally moisturizes the skin inside and out.



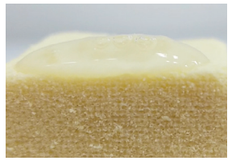
Moisturizing capability

After applying each sample to the test site for one minute, the sample was wiped away and the change in electrical conductivity was determined in order to calculate the change in moisture content of skin corneum. Soluge showed double the moisturizing capability of sodium hyaluronate (the molecular weight of which is approximately 100,000).



From in-house data

Triple-helical collagen



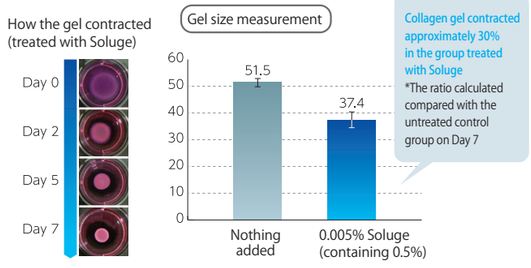
Approach to cells

■ Firmness/Elasticity/Prevention of sagging

Reduced contractility of the dermal extracellular matrix is one cause of declining firmness/elasticity and sagging related to aging. The collagen gel contraction that simulated the dermis demonstrated that Soluge promotes gel contraction.

[Collagen gel contraction test]

Soluge was added to collagen gel mixed with fibroblastic cells, and the cells were cultured for seven days. Then the gel size was measured.



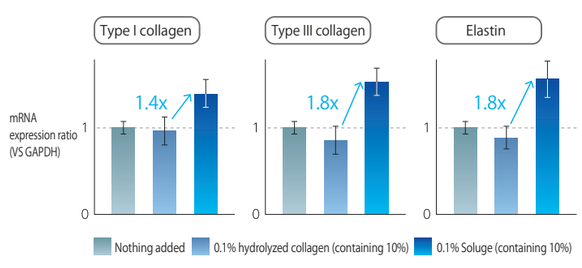
From in-house data

■ Anti-wrinkle

Promotes the synthesis of dermal matrix components that give skin its elasticity (type I collagen, type III collagen, elastin), making the skin elastic and firm.

[Promoting synthesis of dermal matrix components]

Soluge and hydrolyzed collagen were added to fibroblastic cells, and the cells were cultured for 72 hours. Real-time PCR was used to determine the gene expression levels of type I collagen, type III collagen, and elastin.



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