



REGU[®]-AGE PF

Visibly reduces dark circles
and eye puffiness

HEALTH • NUTRITION • MATERIALS



DSM

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CENTERCHEM, INC. NORWALK, CT
Ph: 203-822-9800 Fax: 203-822-9820
www.centerchem.com

For your eyes only

Eyes are the window to the soul. They don't just allow us to see the world – they convey our thoughts, our mood, our deepest emotions. That is why so many of us want to protect the area around the eyes against the effects of aging, fatigue and exposure to the sun, which lead not only to wrinkles, but also to under-eye dark circles and eye puffiness. This can influence the way we are seen and see ourselves.

REGU®-AGE PF is a unique, high performing, paraben-free complex of specially purified natural rice and soy peptides with a biotechnologically produced superoxide dismutase.

As demonstrated by *in vitro* tests, REGU®-AGE PF protects and strengthens the delicate skin under the eyes and has a beneficial effect on capillary circulation.

A consumer study provided conclusive evidence of the most important benefits of using REGU®-AGE PF: it improved skin texture and visibly reduced the appearance of under-eye dark circles and eye puffiness.

Key facts

Unique product features

- Complex of carefully-purified natural soy and rice peptides, and biotechnologically-produced superoxide dismutase
- Paraben-free
- Multi-target mechanisms

Benefits

- Visibly reduces under-eye dark circles and eye puffiness
- Improves skin texture by more than 30% in 4 weeks
- Protects and strengthens the delicate skin under the eyes

Cosmetic application

- For facial care products, especially to combat under-eye dark circles and eye puffiness
- Eye care products

Suggested concentration

- 2 % to 5% REGU®-AGE PF in cosmetic formulations

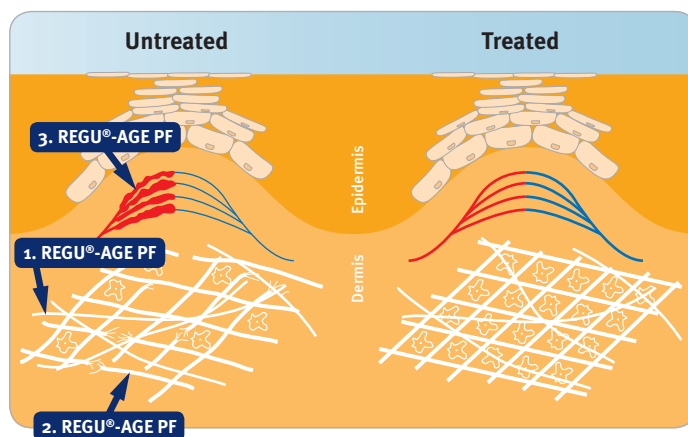
INCI name (Active)

Hydrolyzed Rice Protein, Glycine Soja (Soybean) Protein, Superoxide Dismutase

Mechanism

Dark circles and bags under the eyes are caused by complex interactions. The skin around the eyes, which is already very thin, becomes even thinner as we age. Fatigue, sun damage and aging weaken the collagen and elastin matrix and cause the skin to lose its elasticity. If blood circulation is sluggish in skin capillaries and they become clogged, the pressure build-up has a damaging effect on the already weakened connective tissue. Insufficient supply of oxygen and ongoing inflammation processes by high levels of reactive oxygen species and increased activity of proteolytic enzymes such as collagenase and elastase contribute to the degradation of the collagen and elastin matrix. The consequences are visible dark circles and eye puffiness.

REGU®-AGE PF has been developed specifically to address these multiple conditions.



1 | Protection against oxidative stress

In vitro tests show that REGU®-AGE PF inhibits oxygen free radicals with the help of superoxide dismutase to counter higher levels of oxidative stress after UV exposure.

2 | Strengthens and protects the collagen and elastin matrix

In vitro tests have proven the stimulating effect of REGU®-AGE PF on fibroblast proliferation, which plays a fundamental role in the dermis, to strengthen the collagen and elastin matrix.

In vitro studies confirm that REGU®-AGE PF inhibits collagenases and elastases to protect the collagen and elastin matrix.

3 | Improves capillary circulation

Hemostasis is the arrest of bleeding. It is the combined activity of a large number of individual processes. A number of *in vitro* tests are available to diagnose and monitor the functionality of hemostasis. Both Thrombin Time (TT) and Activated Partial Thromboplastin Time (APTT) are standard screening assays that measure the time until blood is coagulated *in vitro*. They are performance indicators for the efficacy of the hemostasis process. Both *in vitro* tests have demonstrated that REGU®-AGE PF has a beneficial effect on capillary circulation, preventing and minimizing under-eye dark circles.

Efficacy

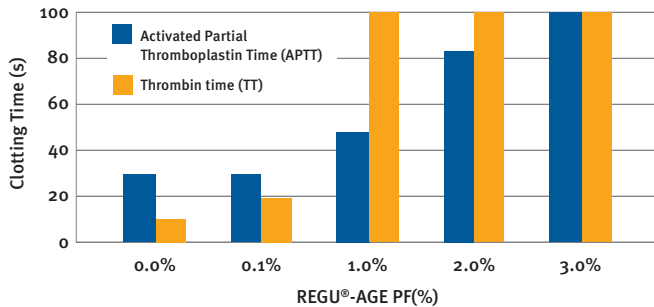
In vitro

Beneficial effect on capillary circulation

Thrombin time (TT): A fibrinogen solution was pre-incubated with REGU®-AGE PF for 1 min before adding a thrombin solution to trigger coagulation. The clotting time was measured using a coagulometer. Typical reference time is 10–15 s.

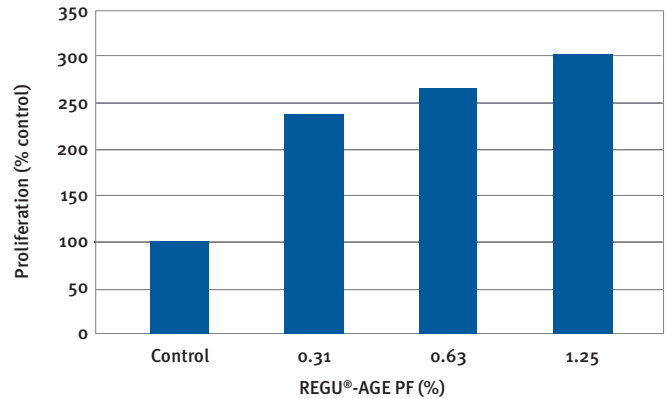
Activated Partial Thromboplastin Time (APTT): An APTT reagent was pre-incubated with REGU®-AGE PF and human standard plasma for 3 min, whereupon calcium chloride solution was added to initiate coagulation. The clotting time was measured using a coagulometer. Typical reference time is 20–39 s.

REGU®-AGE PF increases the clotting time even at low levels and hence improves capillary circulation.



Stimulation in fibroblast proliferation

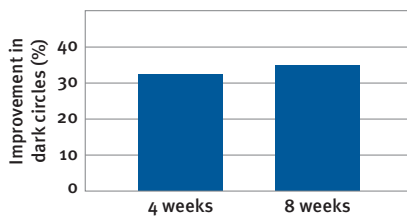
An *in vitro* assay demonstrated that at a concentration of 1.25%, REGU®-AGE PF stimulated a fibroblast proliferation about 200% greater than the control.



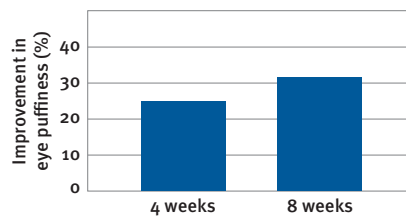
In vivo

Reduction of dark circles and eye puffiness

A double-blind study was performed with twenty subjects. A cream with 5% REGU®-AGE PF was applied to test areas of subjects' faces twice a day after facial cleansing, over a period of 8 weeks. On day 0 and at weeks 4 and 8, evaluations of eye puffiness and dark circles were performed by trained technicians.



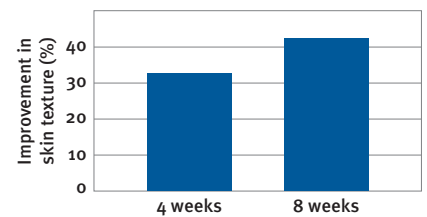
After only 4 weeks of treatment with 5% REGU®-AGE PF a reduction of dark circles of around 32% could be observed.



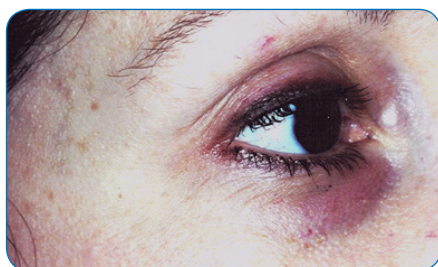
After only 4 weeks of treatment with 5% REGU®-AGE PF, a reduction of eye puffiness of around 25% could already be observed.

Improvement of skin texture

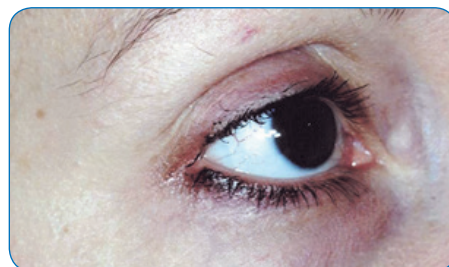
Silicone replicas of the skin texture of the eye area were taken and analyzed via digital image analysis for lines and wrinkles, as well as overall skin texture.



After only 4 weeks of treatment with 5% REGU®-AGE PF, an improvement of skin texture of more than 30% could be observed.



Before treatment



After 8 weeks of treatment

Europe

DSM Nutritional Products Europe Ltd.
P.O. Box 2676, 4002 Basel
Switzerland
Phone: +41 61 815 7777
Fax: +41 61 815 7860
Email: info.pc-emea@dsm.com

Asia Pacific

DSM Nutritional Products Asia Pacific
2 Havelock Road #04-01
Singapore 059763
Phone: +65 6632 6617
Fax: +65 6632 6600
Email: info.pc-apac@dsm.com

North America

DSM Nutritional Products, LLC
45 Waterview Boulevard, Parsippany, NJ 07054
United States of America
Phone: +1 800 526 0189
Fax: +1 973 257 8580
Email: info.pc-na@dsm.com

Latin America

DSM Productos Nutricionais Brasil Ltda.
Av. Eng^o Billings, 1729 Prédio 31
Jaguapé – São Paulo – SP – Brasil 05321-010
Phone: + 55 11 3760 6409
Fax: + 55 11 3760 6492
Email: info.pc-latam@dsm.com

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