Menicon

MENICARE PURE

MULTI-PURPOSE SOLUTION

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More comfort for RGP contact lens wearers

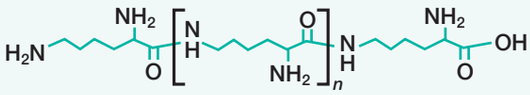
Natural
- Polylysine
- Vitamin C glucoside
- Hyaluronic acid

Clean
- Disinfecting efficacy
- Cleaning efficacy

Pure
- Dual-filtration
- Low toxicity

Natural formulation

Ɛ-Poly-L-lysine (Ɛ-PL)



Natural polymer

Ɛ-PL is a natural homopolymer of the essential amino acid L-lysine.
It is naturally secreted by various Streptomycetaceae bacteria and some filamentous fungi. Industrial production of Ɛ-PL is carried out by aerobic fermentation of Streptomyces albulus strain.

Antimicrobial activity

Because of the cationic nature of Ɛ-PL, it shows high and wide antimicrobial activity. The predominant mechanism for Ɛ-PL's antimicrobial activity is its electrostatic adsorption onto the cell surface of microorganisms leading to stripping of the outer membrane and abnormal distribution of cytoplasm.

Toxicity

Since Ɛ-Polylysine is natural homopolymer of the essential amino acid L-lysine, the toxicity is lower than other cationic disinfectants used in commercial available multi-purpose solutions.

Stability

No degradation/denaturation was observed after boiling at 100°C for 30 min or autoclaving at 120°C for 20 min or storing at room temperature for 3 years.

Polylysine

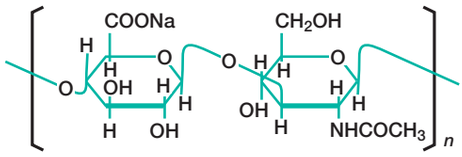
- HPMC
- Hyaluronic Acid
- Macrogolglycerol
- Vitamin C Glucoside

HPMC

HPMC is a high molecular cellulose derivative, that is made from the naturally existing Cellulose fiber.
HPMC adjusts viscosity of the solution to keep good balance that provide good feeling for rubbing and comfortable cushioning effect for insertion.

Hyaluronic Acid (HA)

Hyaluronic acid possesses an excellent ability to retain moisture and has a high affinity to the mucin layer on the corneal epithelium therefore it can support corneal epithelial repair.

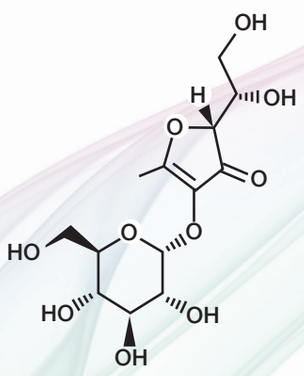


Macrogolglycerol

HCO-60 (Macrogolglycerol Hydroxystearate 60).
HCO-60 is a non-ionic surfactant which is made from vegetable seed oil.
HCO-60 has a good balance between less cytotoxicity (less irritation) and higher cleaning efficacy for lipids. Also HCO-60 has the ability to prevent lysozyme from denaturing.

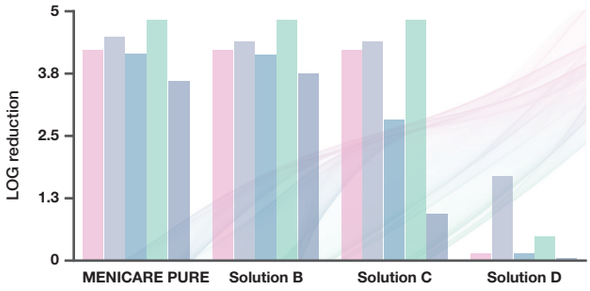
Vitamin C Glucoside (VCG)

VCG is a stabilized vitamin C for aqueous products and once introduced to the eye, VCG decomposes into vitamin C and glucose by enzymatic (glucosidase) reaction. The functions of vitamin C are well known for an antioxidant, anti-inflammatory and collagen production.



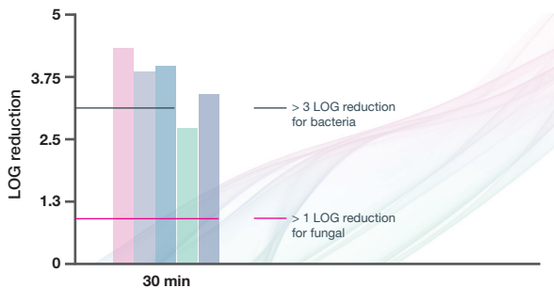
Disinfection efficiency

Disinfection Efficacy
ISO 14729 (60 min at 22°C)



MENICARE PURE met the primary criteria of ISO 14729 stand alone test[1].

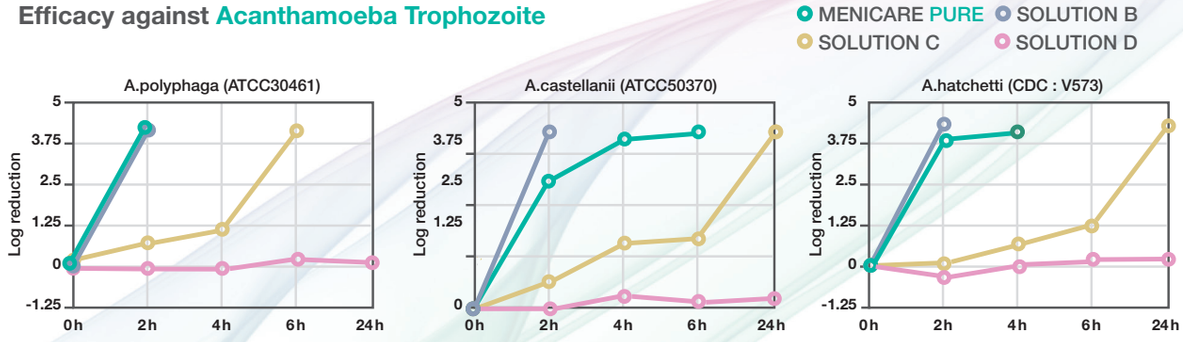
Time Dependence
MENICARE PURE (30 min at 22°C)



MENICARE PURE met the primary criteria of ISO14729 stand alone test within 30 minutes.

Pseudomonas aeruginosa · Staphylococcus aureus · Serratia marcescens · Candida albicans · Fusarium solani

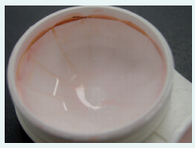
Efficacy against Acanthamoeba Trophozoite

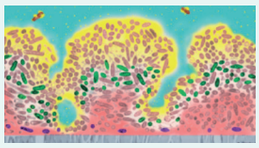


MENICARE PURE is active against A. Trophozoite within 4 hours[2].

Efficacy of MPS against biofilm

Methodology





Lens case vial

Put staphylococcus epidermidis (isolated from contact-lens users) together with medium (as source of nutrition), subsequently incubate the mixture enough time for forming biofilm inside the lens case.

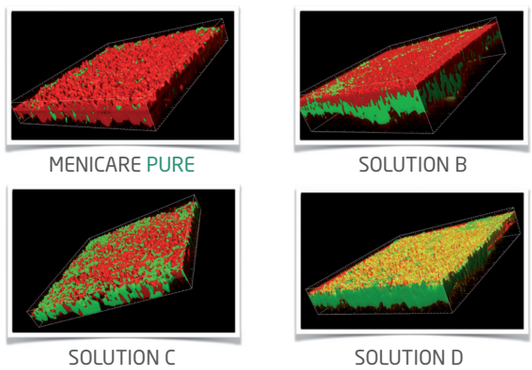
Replace the medium to MPS and leave them for 4 hours, then stain the remaining biofilm by crystal violet.

MENICARE PURE · SOLUTION B · SOLUTION C · SOLUTION D

Image of biofilm treated by MENICARE PURE

[TEST LIVE (Green) / DEAD (Red)]

Almost all bacteria in the biofilm were destroyed by MENICARE PURE solution.

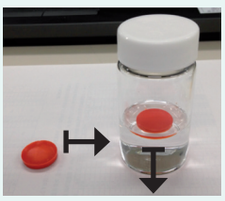


S.epidermidis biofilms were observed by crystal-violet staining and LIVE/DEAD vital dye assay with laser confocal microscopy after 4 hour-treatment with each MPS[3].

Cleaning

[Lipid solubilization]

Methodology



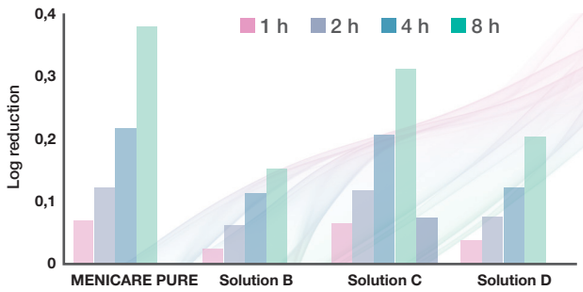
Artificial lipid (Triglyceride) plates with 1% orange dye.

*Triglyceride is one of the main lipids in tears

Measure the absorbance of test solution after 1, 2, 4 and 8 hours to assay the amount of lipid solubilized by surfactant.

Cleaning Efficacy

[Lipid solubilization]



MENICARE PURE showed rapid and good cleaning efficacy for lipid deposit.

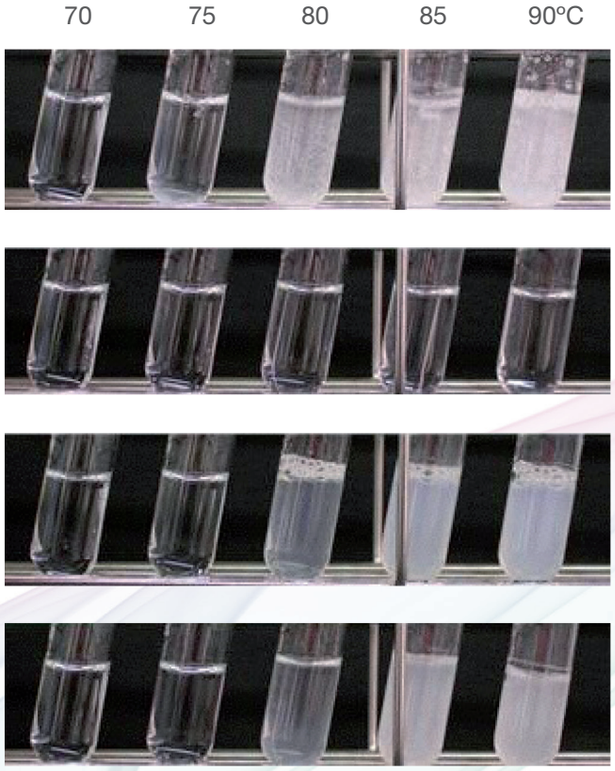
Menicon In-House Data

Protein denaturation

[Lysozyme]

Denatured protein can cause:
- Hydrophobicity
- Deposits on RGP surface
- Discomfort & allergy

Natural-origin surfactant prevents protein from denaturating.



Methodology

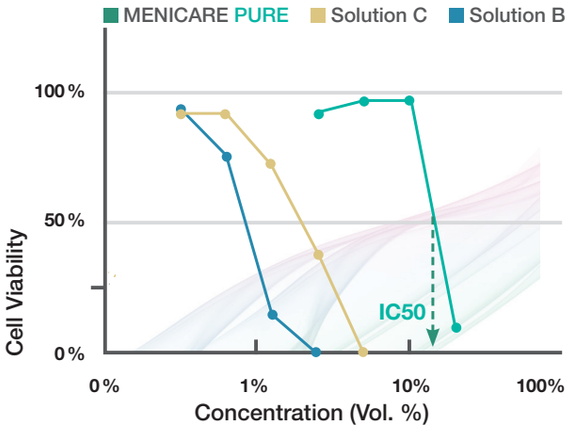
Lysozyme was dissolved in each solution tube (final concentration 0.15 %) then heated at 70°-90° for 5 minutes. Denatured lysozyme becomes visible as whitish deposits.

Menicon In-House Data

Safety

[Cytotoxicity test according to ISO 10993-5 (Colony forming assay)]

l'IC_{50} measurement

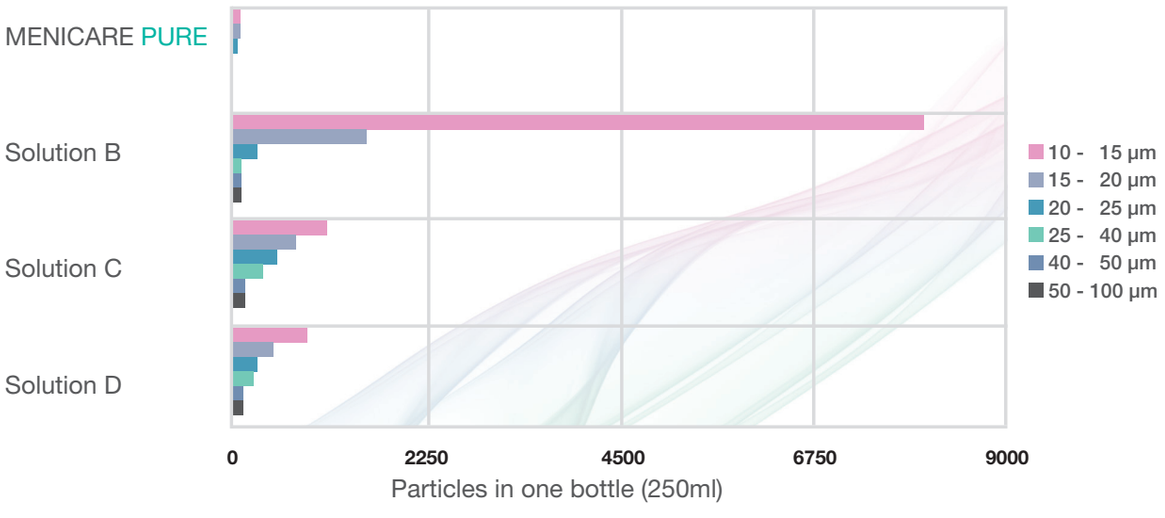


IC_{50} values	Test 1	Test 2
MENICARE PURE	15%	>10%
Solution C	2%	5%
Solution B	1%	5%

IC_{50} : half maximal (50%) inhibitory concentration
Higher IC_{50} values mean lower cytotoxicity.

Dual filtration

[Manufacturing Process]



This method eliminates the microorganisms and insoluble particles of all sizes.

Menicon In-House Data

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MULTI-PURPOSE SOLUTION

Indications

- **Cleaning**
- **Disinfecting : effective after 30 minutes**
- **Rinsing**
- **Storage**

Throw away 3 months after opening
Expiry date : 3 years

[Wetting Efficacy]

MENICARE PURE | Saline (Control)

Methodology

Menicon Z were soaked in MENICARE PURE or saline for 6 hours, after which the coloured (blue) saline was dropped on to the lens surface.

Directions

To open

The dropper tip is sealed.
To open, screw the cap clockwise.
The spike inside the cap will pierce the seal.

Screw the cap clockwise

Steps

Wash your hands thoroughly before handling your contact lenses:

- Rub the lens carefully with several drops of MENICARE PURE for 20 seconds.
- Place the lenses in the right and left lens holder and rinse them with MENICARE PURE.
- Fill the lens case with MENICARE PURE and soak the lenses for at least 30 minutes or overnight.
- Before insertion, rinse the lenses with MENICARE PURE.
- Keep the lens case clean and dry after use.

Lenses may be stored in the unopened case until ready to wear, up to a maximum of 30 days. If you store your lenses for longer periods of time, they must be cleaned and disinfected with MENICARE PURE solution every 30 days.

Menicon recommends to use PROGENT intensive cleaner once a week.

Safe and convenient packaging

- **For better sterility and integrity**
- **Easy handling bottle**

One touch cap.
Health and safety enhanced.

The integrity of the container is preserved, the opening and closing are automatic in one step.
The cap remains attached to the bottle thus limiting the risk of contamination.

MENICARE PURE 250 ml	Starter kit MENICARE PURE & PROGENT	Pack 1 + 1 MENICARE PURE & PROGENT	Travel kit MENICARE PURE & PROGENT
			
MENICARE PURE 250 ml + Lens Case	**MENICARE PURE 70 ml** + Lens Case **PROGENT** (1 dose A + 1 dose B) + PROGENT vial	**MENICARE PURE 250 ml** + Lens Case **PROGENT** (5 doses A + 5 doses B) + PROGENT vial	**MENICARE PURE 2 x 70 ml** + Lens Case **PROGENT** (2 doses A + 2 doses B) + PROGENT vial

References :

1. Antimicrobial properties of a new rigid gas-permeable contact lens multipurpose solution formulated with Polylysine as disinfecting agent. Osamu Mori, MS and Megumi Toyohara, MS. R&D center, Menicon Co. Ltd., Kasugai, JAPAN. Poster BCLA 2014.
2. Efficacy of rigid gas permeable contact lens multi-purpose care solutions against Acanthamoeba Simon Kilvington. University of Leicester, Leicester, UK .Poster BCLA 2014.ester, Leicester, UK 2
3. Efficacy of multipurpose RGP contact lens solutions against bacteria under planktonic and biofilm conditions. Miya Nomachi, Osamu Mori, R&D center, Menicon Co. Ltd., Kasugai, JAPAN Simon Kilvington University of Leicester, Leicester, United Kingdom

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