



## The balance conditioning of contact lenses in the daily exchange of the lenses, before they are placed on the eye

### Conception

Of all the contact-lens systems, it is with the one-day lens that there is the least opportunity to achieve a balance in the physiological components of the tear film.

The „daily soft“ solution corresponds, in its basic components, to the new product-family of CONTOPHARMA Comfort Solutions. In addition, it contains special components to neutralise residues of free oxygen radicals.

The solution is recommended for rinsing and conditioning of one-day lenses before they are placed on the eye, or directly when the lens is in situ.

While with monthly lenses, for example, harmful components are neutralised after they have been worn for a certain time, with a one-day lens this important procedure cannot be carried out adequately as the lenses are replaced each day. Obviously, this balancing procedure has to be carried out not directly on the eye but before the lens is placed in position. Alternatively, it is also possible to apply the solution directly to the lens once it is on the eye. The “daily soft” solution was conceived for this purpose and is therefore recommended for the rinsing of one-day lenses before they are placed on the eye and/or wetting them in situ.

### The eye and contact lenses

The eye and contact lenses have for decades been the subject of controversial discussion, whereby the advantages for the user in terms of comfort and mobility are compared with the long-term risks associated with contact lenses and their use.

### Development principles

Based on the knowledge gained from cellular biology, we have redefined the basic components of wetting solutions. For the special bio-chemical stress that can occur through the use of one-day lenses<sup>1,2</sup>, we have therefore developed a solution which even under unfavourable conditions creates a tissue-compatible milieu between the tear film and the contact lens.

### The problem of free radicals in one-day lenses

Contact lenses are manufactured through the polymerisation of reactive components, e.g. acryl ester. With this technique a small portion of the reactive components always remains in the matrix of the lens in unbound form. In daylight, these components have the potential to form radicals which then react chemically with the cells of the cornea and can cause inflammatory processes on the eye. With one-month and one-year lenses the reactive components are flushed out in the solution in which the lenses are kept when not in use. This is not the case with the one-day lenses, which are replaced each day.

This was taken into account in the development of the “daily soft” solution, having used ingredients which neutralise the reactive components, i.e. which reduce the potential for the formation of radicals in the one-day lenses.

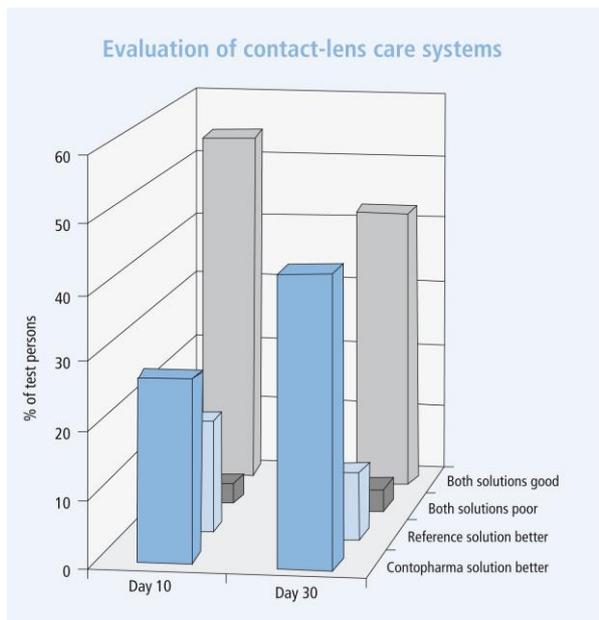
### Our investigations

The conveyed „daily soft“ solution has been studied in different biological systems, in order to ensure the greatest possible safety for the user: in cell cultures<sup>6</sup> the new solution was tested, under short-term (“acute toxicity”) and long-term (“chronic toxicity”) exposure, on epithelial cells, which react very sensitively to different chemicals. In these tests, at physiological temperatures toxicity of the “daily soft” solution in the cell culture could be excluded.

In a model of corneal epithelial wound healing<sup>3,5</sup> in which we had already earlier assessed a series of contact-lens care solutions as potentially harmful to epithelial tissue<sup>4</sup>, the “daily soft” solution was shown not to inhibit the epithelial wound healing.

The effect of the “daily soft” solution on the physical properties<sup>6</sup> of all the currently available types of contact lenses were investigated. In these tests the results of all the measurements met the relevant ISO standards.

The “daily soft” solution was tested in a clinical trial for its practical suitability in trial subjects<sup>6</sup> in comparison with another commercially available contact-lens care solution. This was a multicentre, double-blind, randomised study and thus met the presented “gold standard” for clinical trials.



*Clinical trial:  
Increasing comfort with increasing length of wearing time*

In this study, after ten days the „daily soft“ solution was found to be at least equal to the reference solution. After use over a period of 30 days, a clear trend towards the better tolerability of “daily soft” was observed.

#### Other instructions

Before handling the lenses, the use of a non-greasy, alkali-free soap with a bactericidal effect such as „Contabelle soap for hands“, which washes the hands perfectly clean, is to be recommended. In order to restore the natural grease to the skin, *after* handling the contact lens it is recommended to use “Contabelle hand care”.



Contabelle soap for hands



Contabelle hand care

The Contopharma comfort solution “drop & see” is recommended in case of small amounts of tear liquid and “lens & lid” in case of a rather greasy tear film. With “drop & see”, the cellular functions of the cornea are supported by the balanced composition of the active substances. With “lens & lid”, the contact lenses are protected by the optimised composition of the solution against contamination while they are being worn.

#### Summary

As a complement to the basic improvements that were introduced with the new comfort solutions, the „daily soft“ solution meets the special needs and requirements of contact lens users.

Free radicals should be neutralised before the contact lens is placed on the eye, in order to improve the spontaneous tolerability and to maintain the comfort when wearing the lenses even over long periods of time.

#### Confection

- 100 ml

#### Littérature

- 1 H.W. Roth: Das Cornea-Deprivation-Syndrom nach Tragen von One-Day Kontaktlinsen; Die Kontaktlinse, Vol. 11, 11–13, 1998
- 2 H.W. Roth: Das Cornea-Deprivation-Syndrom(CDS); Contactologia, 20, 65–70, 1998
- 3 C.P.Lin, M. Böhnke: Effect of Fortified Antibiotic Solutions on Corneal Epithelial Wound Healing; Cornea 19, 204–206, 2000
- 4 C.P.Lin, J.Y. Chen, M. Böhnke: Influences of Hydrogel Contact Lens Care Solutions on Corneal Epithelial Wound Healing; Kaohsiung Journal of Medical Sciences, Vol. 14, No. 01, 639–643, 1998
- 5 C.P.Lin, M.Böhnke: Influences of Methylcellulose on Corneal Epithelial Wound Healing. Journal of Ocular Pharmacology and Therapeutics, Vol. 15, No. 1, 59–63, 1999
- 6 data on file: Contopharma AG, Interlaken

New developments can be achieved today only through the networking of existing resources. For the design of the new “daily soft” solution a thorough knowledge of cell biology and corneal physiology was combined with pharmacological manufacturing capability. With the tools of pure research (cell culture, in vitro experiments, physical measurements) and clinical trials, an optimally researched, safe and effective Comfort Solution was developed.

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