

CONTACT LENSES

Flat pack formation

Neil Retailic discusses the small eco-friendly packaging yet big performance of Miru 1day Menicon Flat Pack daily disposable contact lenses

Consideration for the impact we have on our environment is an important on-trend global topic. Unsurprisingly, this is increasingly influencing consumer purchasing habits, with the Chartered Institute of Marketing highlighting that some customers are making judgements based solely on packaging and sustainability aspects. Furthermore, they reported that eight in 10 consumers would like to see more done by companies to promote sustainable packaging and warned of potential reputational damage for those with less eco-friendly offerings. In addition, those who are more eco-conscious among us are willing to spend on average 20% more for products where there are benefits for the planet over the alternatives.¹

“8/10 adults want businesses to focus on sustainability and reduce excess product packaging to help the environment.”

Contact lens wearers have similar strong opinions with 87.5% rating the environmental impact of contact lenses as ‘important’ or ‘very important’ and 97.5% stating that contact lens manufacturers should focus on environmental aspects as a ‘medium’ or ‘high’ priority.²

The good news is the contact lens industry has been making strides in this field, producing more eco-friendly contact lens packaging, reducing wastage, and focusing on sustainability aspects.

A game changing innovative approach with daily disposable contact lens packaging was the introduction by Menicon of Miru 1day Menicon Flat Pack. The super slim packaging (approximately 10-12% of the thickness of typical blisters) results in an 80% waste saving when comparing a one-year supply (figure 1).³ This, combined with the eye grabbing colourful foil appearance (figure 2) often makes the packaging a hot talking point, attracting even those who are apprehensive about contact lenses.

This article seeks to explore beyond the fun eco-friendly

FIGURE 1 Comparison of a one-year supply (730 lenses) of conventional packaging and Miru 1day Menicon Flat Pack packaging



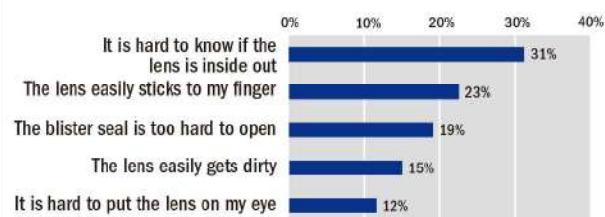
FIGURE 2 Miru 1day Menicon Flat Pack packaging



FIGURE 3 Smart Touch technology design compared to conventional packaging



FIGURE 4 Handling frustrations in existing daily disposable wearers, n=1,031 (multiple answers could be selected and 31% selected no handling issues.⁶



packaging the clinical and performance attributes the lens provides the wearer.

SMART CONTACT LENS PACKAGING

Miru 1day Menicon Flat Pack was the first daily disposable contact lens to feature the consumer inspired Smart Touch technology. Where the packaging cleverly ensures the lens is raised within the blister, allowing it to be gently pinched from the packaging while maintaining the correct orientation (figure 3). This avoids the need to touch the inner lens surface (which comes into direct contact with the eye) during lens handling and application. This results in a reduction in the risk of lens contamination on the inner surface during lens handling by around three to four times, when compared to conventional lens packaging.^{4,5}

This innovation in lens packaging brings a more hygienic and convenient experience, addressing the frustrations reported by around one in three daily disposable wearers regarding difficulties telling if their current lenses are inside out prior to application. An overview of the top handling challenges⁶ can be found in figure 4. Furthermore 91% of those who experienced lenses in Smart Touch packaging agreed this provided benefits over conventional packaging designs.⁷ These advantages may also support new wearers given a key reason for drop out are handling related challenges⁸ and the surprising discovery that some experienced daily disposable wearers report spending over five minutes →

CONTACT LENSES

TABLE 1 Benefits of Smart Touch technology

| | |
|------------------------------------|--|
| Hygiene | Less chance of contamination to the inner lens surface during application |
| Convenience | No need to worry if the lens is inside out and a quicker handling experience |
| Compliance and wearer satisfaction | The packaging promotes less chance of reusing as a storage device and supports with reducing the risk of handling related drop out |

FIGURE 6 Centraform manufacturing process

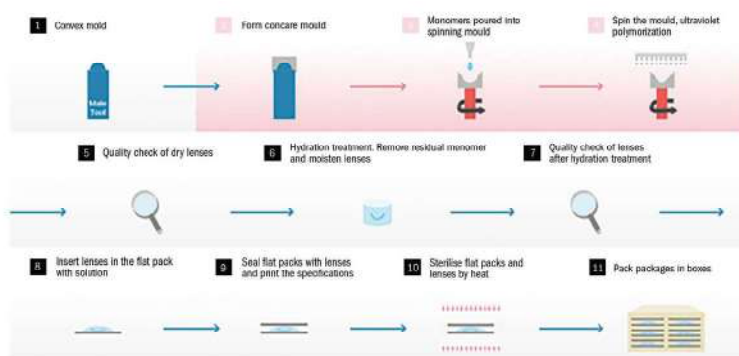


TABLE 2 Daily disposable contact lens parameters and characteristics

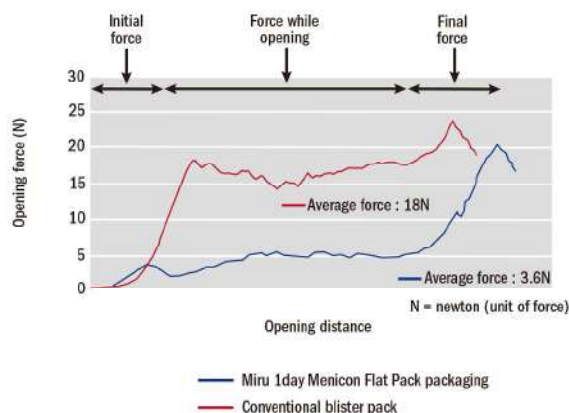
| Name | Miru 1day Flat Pack | 1day Acuvue Moist | Dailies Aquacomfort Plus |
|------------------|---|---|--|
| Material | Hioxifilcon A | Etafilcon A | Nelfilcon A |
| Replacement | daily | daily | daily |
| Technology | Smart Touch | Lacreon Technology | LightStream Lens Technology, blink-activated moisture technology |
| Centre thickness | 0.10mm | 0.084mm | 0.10mm |
| Water content | 57% | 58% | 69% |
| Base curves | 8.6mm | 8.5mm/9.0mm | 8.7mm |
| Diameter | 14.2mm | 14.2mm | 14.0mm |
| Sphere power | +4.00D to -10.00D (0.50D steps after -6.00) | +6.00D to -12.00D (0.50D steps after -6.00) | +8.00D to -15.00D (0.50D steps after +6.00 and -6.00) |
| Handling tint | Light blue | Visibility tint | Blue Visi tint |
| UV | No | 98%.8% UVB, 85.1% UVA | No |
| Family available | Sphere, toric and multifocal | Sphere, toric and multifocal | Sphere, toric and multifocal |

applying their contact lenses.⁶ With regards to hygiene, for 17.5% of people, the fear of (or a history of) infection was enough reason for them to stop using contact lenses.⁹

The benefits of Smart Touch technology are summarised in table 1.

Attention has also been given to how easy opening of the blister is for wearers with around 5x less force required to open Miru 1day Menicon Flat Pack when compared to conventional packaging (figure 5).¹⁰ In addition to promote better compliance and avoid the packaging being reused as a storage case, the blister does not have the usual bowl configuration and only contains 0.2ml of solution.

FIGURE 5 Force required to open contact lens packaging



WHAT ABOUT THE LENSES WITHIN THE PACKAGING?

Miru 1day Menicon Flat Pack is produced using Centraform (figure 6). A unique fully automated lens manufacturing process that results in high quality soft aspheric contact lenses in comfortable thin lens designs. By using just one mould during production this further adds to the eco-credentials.

The resulting poly (HEMA-GMA) material, known as Hioxifilcon A is particularly suited for supporting an optimum tear layer on the cornea as its composition mimics mucin, a natural oligosaccharide found in the tears that creates a wettable cornea. GMA also provides two times more hydroxyl groups (OH-) than using HEMA alone. This combined approach creates a contact lens with high water attraction and binding capabilities to enhance comfort and reduce dryness.

HOW DOES MIRU 1DAY MENICON FLAT PACK PERFORM?

A recent clinical study conducted by a contact lens research institution reveals insights into how the lens performs, with direct comparisons to two other daily disposable contact lenses. Table 2 provides an overview of the features and characteristics of the study lenses.

HANDLING PERFORMANCE

Application and removal from the eye of Miru 1day Menicon Flat Pack demonstrated strong performance, with participants reporting the highest scores of 93.7% and 95.5% respectively on follow up consultations (figure 7). Attributes that support handling may include Smart Touch technology, good shape retention and moisture retention properties.

To support easier lens identification and removal from the blister the lower amount of shipping solution in the packaging (0.2ml V 0.8ml in conventional blisters) and lack of traditional bowl design are advantageous.

VISUAL AND COMFORT PERFORMANCE

When reviewing the objective visual measurements in the study there was strong visual performance with all lenses (figure 8). Aspheric optical designs aim to improve visual comfort and to minimise high order aberrations,¹¹ supporting vision, especially in low lighting conditions when the pupils are larger (figure 9), as well as for those with high refractive errors.

The study confirmed great comfort scores at the follow up visit (86%) and a higher proportion of excellent ratings when compared to the other study lenses for overall and end of day comfort (figure 10). This finding of superior comfort is consistent with

FIGURE 7 Results for handling and comfort aspects on follow up visit

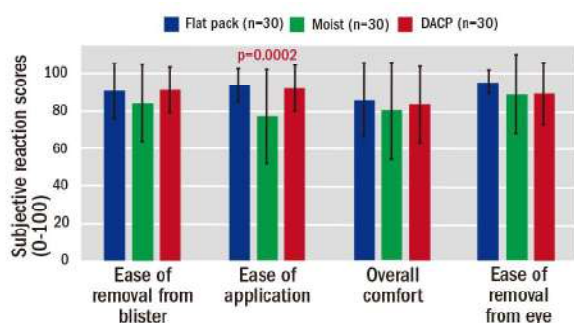


FIGURE 9 Benefits aspheric lenses may provide with minimising spherical aberrations in situations such as those with 'night myopia'

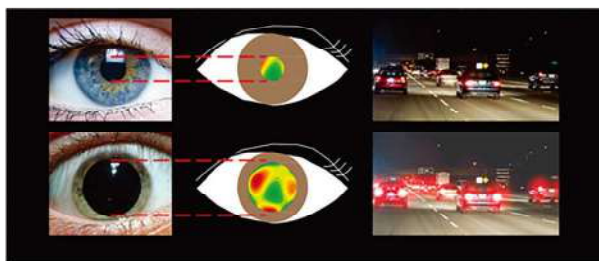
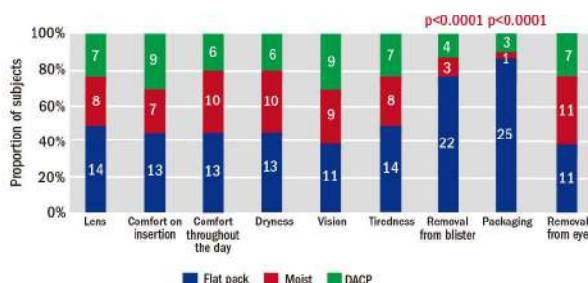


FIGURE 11 Lens preferences for various performance related aspects



various previous studies.^{2,12} The reasons for strong comfort performance are likely to be from multiple contributions, including a balance between a smooth low friction lens surface, good moisture retention properties and a thin aspheric design.

SUMMARY

In general the lenses in the study had similar fitting characteristics, minimum impact on the eye and highly comfortable wearing schedules. There was a favouring towards Miru 1day Menicon Flat Pack when compared to the other lenses for all aspects beyond packaging reasons alone. The only exception was removal from eye, where it was joint highest (figure 11). This overall preference for the Menicon material further validates the finding of two previous studies. The first when comparing to wearer's habitual lenses¹² and the second where the Miru 1day Menicon Flat Pack toric had a majority preference (60%) over the control lenses (40%).²

The additional benefits of Smart Touch technology were well received as a majority of those involved in the study admitted they have worn their current lenses inside out by mistake (76%) and agreed that removing the lens from the blister the right way up is important for good eye and contact lens health (94%).

FIGURE 8 Visual acuity measurements of the lenses

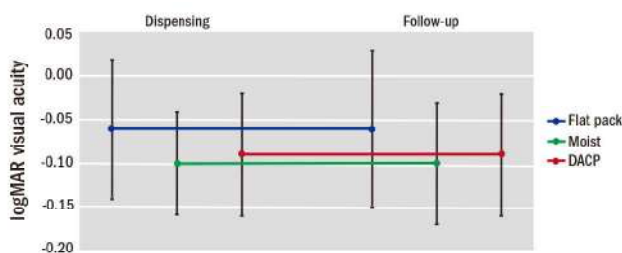
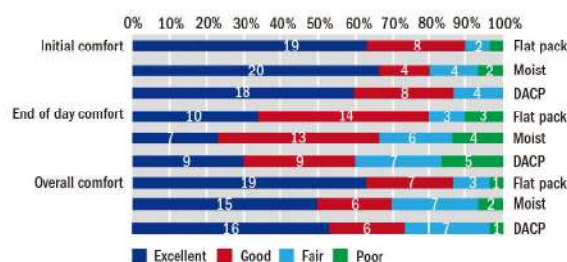


FIGURE 10 Subjective comfort ratings at follow up per description



The lens is ideal for those with active on-the-go lifestyles given its ease to transport and is a great compliment to spectacles, bringing practical, visual and psychological benefits.¹³ To further cater for a wide variety of needs a full family is available. The toric features a thin bi-aspheric design for those with astigmatism and the multifocal has the progressive Neural Adaptive Design to support those with presbyopia.

In conclusion, Miru 1day Menicon Flat Pack demonstrates strong all-round performance and has been designed to improve wearer retention, providing more than just eye-catching eco-friendly packaging.

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The author would like to thank Kimiko Kadohara, Keiji Sugimoto, Sachiko Nishimura, Mizuki Ueda, Hideaki Wakamatsu and Steve Newman for kindly reviewing this article.

REFERENCES

- <https://www.cim.co.uk/newsroom/release-consumers-demand-sustainable-packaging> Accessed 27.09.22
- Mojarrad N *et al.* Performance and environmental perceptions of a novel toric hydrogel contact lens. NCC clinical poster 2022
- Menicon data on file, in comparison with previous Menicon product.
- Tan J, *et al.* Factors Affecting Microbial Contamination on the Back Surface of Worn Soft Contact Lenses. *Optometry and Vision Science*, 2021. 98(5): p. 512-517.
- Nomachi M, *et al.* Evaluation of diminished microbial contamination in handling of a novel daily disposable flat pack contact lens. *Eye and Contact Lens*, 2013. 39(3): p. 234-8
- Retallic N, Nagra M. Getting to grips with soft contact lens handling. *Optician*. 4 February 2022: p30-36
- Menicon data on file: Smart Touch Survey conducted by Menicon Co., Ltd

Full references available online at opticaionlin.net