

Research Brief for Eye Care Practitioners: **contact lens materials development** clinical significance

In the laboratory, our focus is on developing and improving contact lens materials with the objective of optimizing ocular health and comfort. The language we use to communicate these material properties may be unfamiliar to those in clinical practice. We asked Dr. Andrew Pucker to help us explain.



OXYGEN PERMEABILITY (Dk) describes a material with respect to how easily oxygen is able to passively diffuse into it.

Dk only tells you about a contact lens material, not the lens itself. Lens thickness has no impact on Dk.



OXYGEN TRANSMISSIBILITY (Dk/t) describes a contact lens with respect to the ease with which oxygen passively diffuses through it.

An inadequate flow of oxygen to the eye can lead to complications related to oxygen deprivation (hypoxia). Lens thickness has an impact on Dk/t.



MODULUS is a measure of the stiffness of a contact lens material.

Lenses with a low water content usually have a higher modulus, and vice versa. Modulus can also vary with temperature. A higher modulus can be associated with mechanically induced complications such as superior epithelial arcuate lesions (SEALs) and contact lens-associated papillary conjunctivitis (CLPC).



CONTACT ANGLE is a measure of the wettability of a contact lens.

We calculate it by measuring the angle formed between a surface and a drop of liquid. Contact lenses that have a higher contact angle may result in lower levels of contact lens comfort.



COEFFICIENT OF FRICTION is a measure that we use to quantify the friction between a lens and the eyelid or ocular surface.

It takes into account the force needed to move one surface across another as well as the pressure between the two surfaces. Contact lenses that have a higher coefficient of friction may result in lower levels of contact lens comfort.