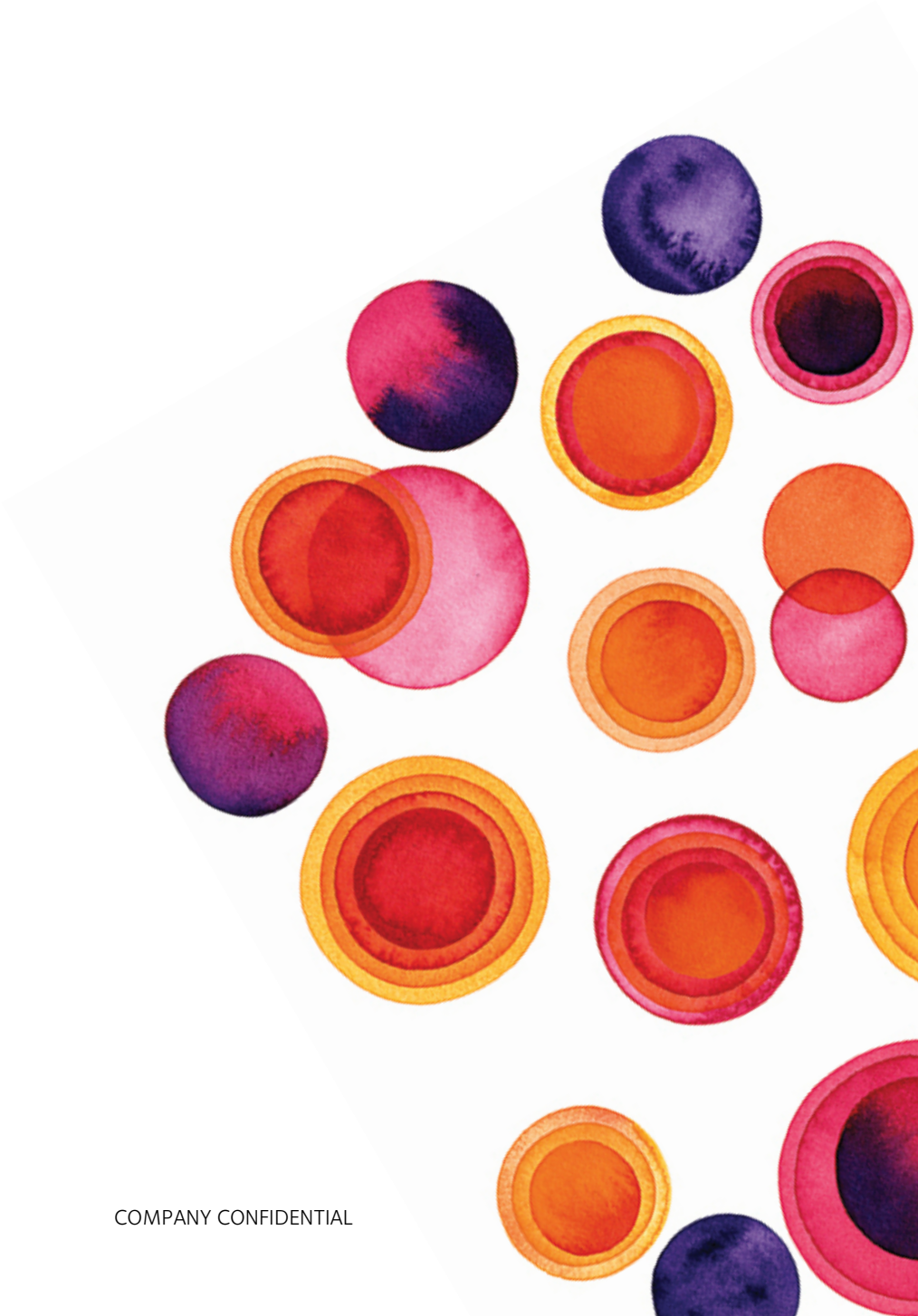
Product knowledge

The structure of the human eye, common vision problems, contact lenses and their key parameters



CooperVision™

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About this module

Please read and familiarise yourself with the scope of this training module, described below. This document is yours to keep, so feel free to add personal notes or comments to any of the pages or use the *Notes* page provided at the end of this module.

Study the content of this module carefully, including any stated references, and complete the tasks specified to demonstrate your understanding of the subject and your attainment of the skills specified by the assessment criteria for each of the learning outcomes.

Training module details

The details of this training module are specified in the table below.

Table 1 Training Module Details

Title	Product knowledge	Reference	LD-1000-104
Intended for	Trainee engineers	Duration	2 days
Summary/Descriptor			
The objective of this module is to familiarise you with the structure of the eye and the visual problems that can occur. This module identifies and describes each of the main contact lens types, the significant parameters and the contact lens families produced by CooperVision UK Manufacturing and provides essential background information on their strengths and weaknesses.			
Prerequisites			
The following items are required for the completion of this module: • No prerequisites required.			

Learning outcomes and assessment criteria

The table below details the learning outcomes and associated assessment criteria for this training module. The assessment criteria will be evaluated by performing the associated assignment (answering a question or performing a task). Tasks may employ the following learning methods:

TASK	TASK	TASK	TASK
Practical / Hands-on	Classroom-based	Online / E-learning	Self-directed

Table 2 Learning Outcomes and Assessment Criteria

Learning Outcomes (The trainee will…)		Assessment Criteria (The trainee can…)		
1.	Understand the structure of the human eye.	1.1	Identify the main parts of the human eye and common vision problems.	TASK 1
		1.2	Describe in detail the parts of the human eye and its common vision problems.	TASK 2
		1.3	Describe in detail the parts of the human eye.	Question 1
2.	Understand the anomalies of the human eye and how they lead to blurred vision.	2.2	Describe in detail the common vision problems associated with the human eye.	Question 2
3.	Know the main types of contact lens designed to assist with visual anomalies.	3.1	Describe in detail the contact lens types and their function.	Question 3
4.	Be familiar with the families of contact lenses manufactured by CooperVision.	4.1	Identify the contact lens families manufactured by CooperVision.	TASK 3
		4.2	Describe the contact lens families manufactured by CooperVision.	Question 4
5	Understand the main features and key parameters of CooperVision's contact lenses.	5.1	Describe in detail the features and key parameters of CooperVision's contact lenses.	Question 5

Related training

You may wish to consider the following related training courses and/or modules:

- Lens Design and Metrology 1

You can find more details about these courses on the CooperVision Academy. Please discuss with your Line Manager if you would like to apply.

What you need to know

Read the following information, including any stated references, and complete the tasks specified to gain a detailed understanding of this subject and to understand what CooperVision do and why we do it.

TASK 1: Attend "Products & Processes"

Attend the Products & Processes course. This course will cover the following subjects, at a basic level:

- Structure of the eye.
- Vision problems.
- Contact lens types and geometry.

The course Trainer must sign below to witness that the trainee has completed the task and has attained the required level of understanding and competence.

Signature (Line Manager): _____ Date: _____

TASK 2: Read "The Human Eye"

Read "The Human Eye".- an internal CooperVision PDF document (contact L&D for a copy). This document will explain in more detail than was possible on the "Products and Processes" induction training course.

The Line Manager must sign below to witness that the trainee has completed the task and has attained the required level of understanding and competence.

Signature (Line Manager): _____ Date: _____

Structure of the human eye

The structure of the human eye is detailed in the diagram below.

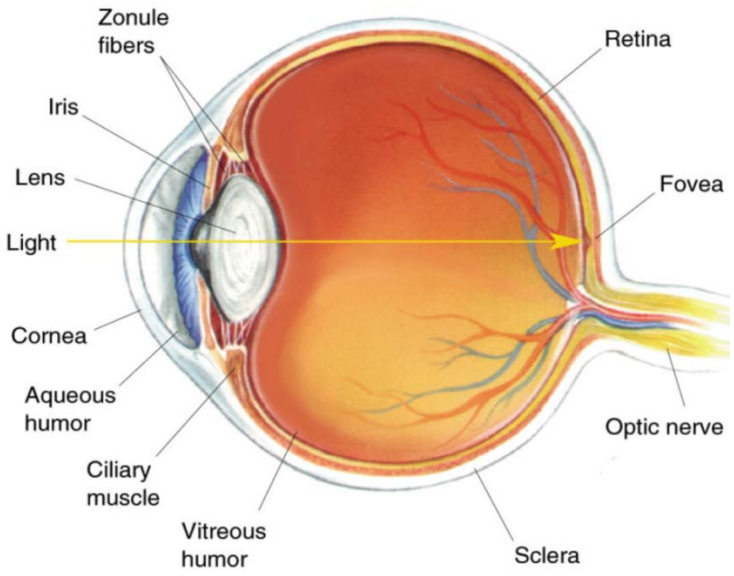

Figure 1 Structure of the Human Eye

Zonule fibers

A ring of fibrous strands connecting the ciliary body with the crystalline lens of the eye.

Iris

A thin, circular structure in the eye, responsible for controlling the diameter and size of the pupil and thus the amount of light reaching the retina. The colour of the iris gives the eye its colour.

Lens

The crystalline lens is a transparent, biconvex structure in the eye that, along with the cornea, helps to refract light to be focused on the retina. The lens, by changing shape, functions to change the focal distance of the eye so that it can focus on objects at various distances, thus allowing a sharp real image of the object of interest to be formed on the retina. This adjustment of the lens is known as "accommodation". Accommodation is similar to the focusing of a photographic camera via movement of its lenses. The lens is more flat on its anterior side than on its posterior side.

In humans, the refractive power of the lens in its natural environment is approximately 18 dioptres, roughly one-third of the eye's total power.

Cornea

The cornea is the transparent front part of the eye that covers the iris, pupil, and anterior chamber. The cornea, with the anterior chamber and lens, refracts light, with the cornea accounting for approximately two-thirds of the eye's total optical power.

In humans, the refractive power of the cornea is approximately 43 dioptres. While the cornea contributes most of the eye's focusing power, its focus is fixed. The curvature of the lens, on the other hand, can be adjusted to "tune" the focus depending upon the object's distance.

Aqueous humour

A transparent, gelatinous fluid similar to plasma, but containing low protein concentrations. It is secreted from the ciliary epithelium, a structure supporting the lens. It is located in the anterior and posterior chambers of the eye, the space between the lens and the cornea. It is not to be confused with vitreous humour, which is contained within the larger cavity of the eye behind the lens.

Ciliary muscle

A ring of striated smooth muscle in the eye's middle (vascular) layer that controls viewing objects at varying distances and regulates the flow of aqueous humour into Schlemm's canal. It contracts to increase the convexity of the lens, which in turn increases the optical power of the eye.

Vitreous humour

The clear gel that fills the space between the lens and the retina of the eyeball of humans and other vertebrates. It is often referred to as the vitreous body or simply "the vitreous".

Sclera

The sclera (from the Greek *skleros*, meaning *hard*), also known as the white of the eye, is the opaque, fibrous, protective, outer layer of the eye containing collagen and elastic fibre. In humans the whole sclera is white, contrasting with the coloured iris.

Optic nerve

Also known as “cranial nerve II”, transmits visual information from the retina to the brain.

Fovea

Also generally known as the “fovea centralis” (from the Latin, meaning *pit* or *pitfall*), is a part of the eye, located in the center of the macula region of the retina. The fovea is responsible for sharp central vision necessary for activities where visual detail is of primary importance, such as reading and driving.

Retina

The retina (from Latin *rēte*, meaning *net*) is a light-sensitive layer of tissue, lining the inner surface of the eye. The optics of the eye create an image on the retina (through the cornea and lens). Light striking the retina initiates chemical and electrical events that trigger nerve impulses. These are sent to various visual centres of the brain through the fibres of the optic nerve.

Common vision problems

Short-sightedness (Myopia)

"Short-sightedness " (British English) or "near-sightedness" (American English) is the inability to see objects clearly at a distance. Close objects are clear but distant objects are blurred.

Cause	Correction
The cause of myopia is usually genetic and will usually occur at a young age. People who suffer from myopia usually have a longer eyeball than normal, causing images to focus inside the eye, in-front of, rather than on, the retina.	Requires **negative** Sphere power correction to compensate for the excessive positive diopters of the myopic eye. Severe myopia is defined as -6 diopters or greater.

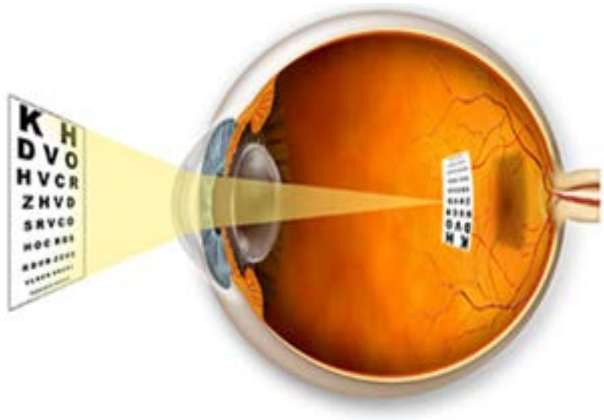

Figure 2 Short Sightedness (Myopia)

Long-sightedness (Hyperopia)

"Long-sightedness" (British English) or "far-sightedness" (American English) is the inability to see close-up objects clearly. Distant objects are clear but near objects are blurred.

Cause	Correction
People who suffer from hyperopia usually have a shorter eyeball or flatter cornea than normal, causing images to focus outside the eye, behind, rather than on, the retina.	Requires **positive** Sphere power correction to compensate for the excessive positive diopters of the hyperopic eye.

Figure 3 Long Sightedness (Hyperopia)

Astigmatic (Astigmatism)

Astigmatism causes blurring of close-up and distant objects.

Cause	**Correction**
People who suffer from astigmatism have a rugby-ball-shaped distortion of the cornea that causes two focusing images to occur at 90 degrees in the eye, resulting in blurring of both near and distant objects.	Requires **toric/cylinder** correction to compensate for the astigmatic distortions of the eye.

Figure 4 Astigmatic (Astigmatism)

Aging Eye (Presbyopia)

Presbyopia is the condition in which the lens loses its ability to focus due to ageing. A common condition for the over 45's that impairs the ability to see close-up objects, often resulting in eye fatigue and headaches until some form of eye correction is applied.

Cause	Correction
People who suffer from presbyopia begin to lose some of the elasticity needed to focus on near and distant objects, causing images to focus outside the eye, behind, rather than on, the retina.	Requires **multifocal** correction to compensate for the ageing of the eyes.

Figure 5 Aging Eye (Presbyopia)

Lens types

CooperVision are the largest manufacturer of specialty contact lenses. Several different lens types are available, each designed to correct a particular vision problem.

Spheres

Spherical lenses can correct Myopia or Hyperopia. They do this by moving the focal point onto the retina, however spherical lenses are good, but not perfect, in achieving this.

As parallel light rays pass through a spherical lens each has a different focus position. On a contact lens this means that the power changes from the centre, radially to the edge of the optic zone.

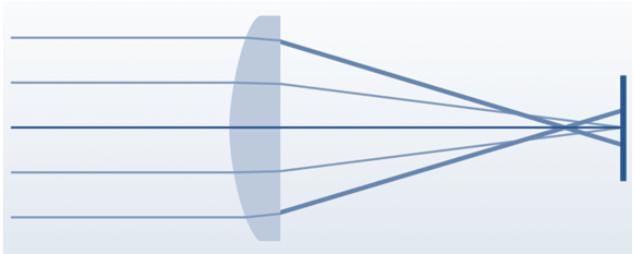

Figure 6 Spherical Lens

Aspheres

Aspherical lenses can also correct Myopia or Hyperopia. These lenses have a complex radius which not only moves the focus point but also achieves a sharper image focus on the retina.

An Asphere lens has a radius which continually changes from the centre, radially out towards the edge. This complex form means that parallel light rays are all focused to the same point. On a contact lens this means that the power is the same across the whole optic zone. It is possible that people with "perfect vision" would benefit from having a zero power aspheric contact lens to improve clarity of vision.

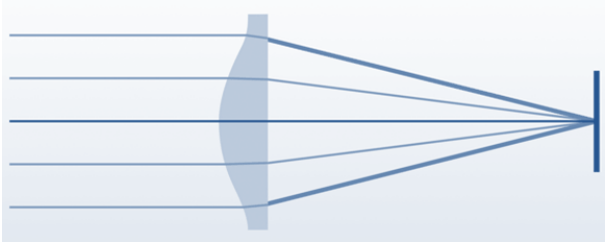

Figure 7 Aspherical Lens

Torics

Toric lenses are designed to correct Astigmatisms. To do this the lens needs to counteract the abnormal 'rugby ball' shape of the eye.

Firstly a spherical correction is placed on the front surface to correct any Myopia or Hyperopia the patient may have. A cylinder is then placed on the back surface with a 'rugby ball' form. By placing this form at 90º to the 'rugby ball' form on the patients eye the defect can be neutralised. To ensure the cylinder stays in position a ballast is added to the front surface of the lens.

Multifocals

Multifocal contact lenses are designed to allow different lens powers that target vision at varying distances from the wearer. They are unique to CooperVision and are consist of a unique pairing of lenses: a D-type (for the dominant eye) and an N-type (for the non-dominant eye). The dominant eye looks directly at an object and the non-dominant is used for depth perception. This introduces a new way of seeing for the wearer and can take several weeks to train the brain to see this way.

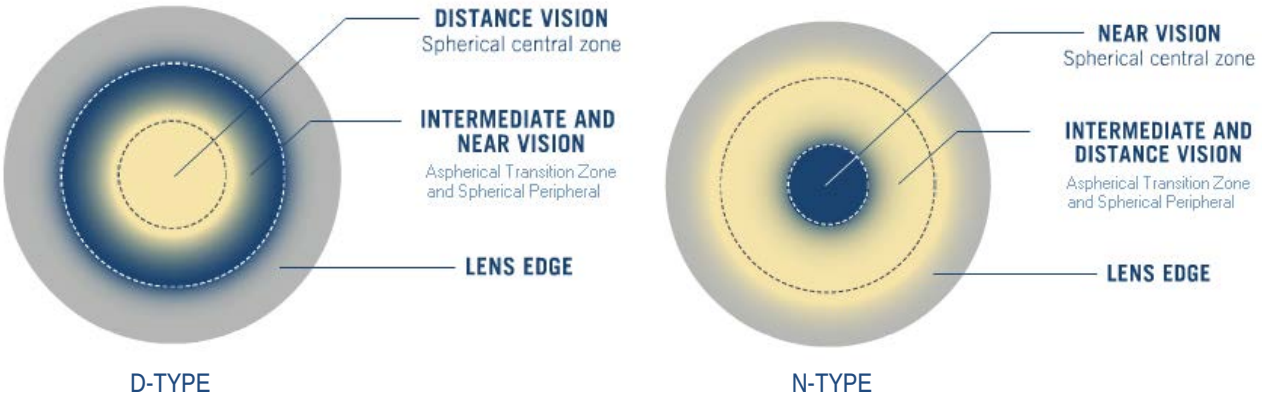

Figure 8 Multifocal Lens

Multifocal Torics

Multifocal Toric lenses combine the Multifocal and Toric lens geometries into a single lens. As with a standard Toric a cylinder is placed on the back surface of the lens with the Multifocal form placed on the front surface.

Colours

Coloured lenses are designed to enhance the appearance of the eye. There are many reasons a patient may want coloured lens so CooperVision manufactures different types of lenses to cater for different needs.

Lens key parameters

The contact lens key parameters are shown in the diagram below.

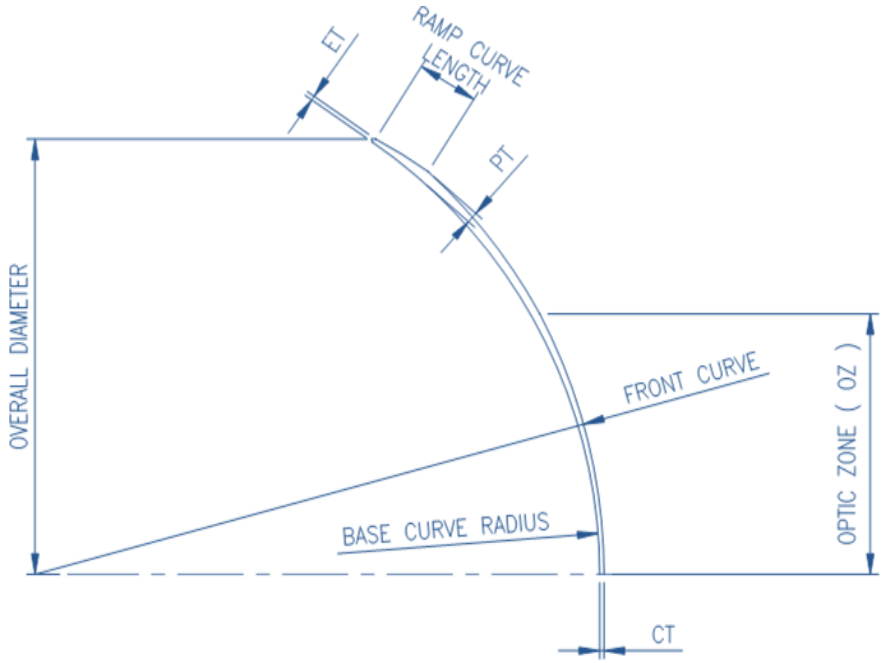

Figure 9 Lens Key Parameters

Power/Sphere (PWR/SPH)

The dioptre is the unit of measurement of the optical power, or strength, of the contact lens, which is equal to the reciprocal of the focal length measured in metres. For example, a 3-dioptre lens brings parallel rays of light to focus at 1/3 metre.

The benefit of using optical power rather than focal length is that when relatively thin lenses are placed close together their powers approximately add. Thus, a thin 2-dioptre lens placed close to a thin 0.5-dioptre lens yields almost the same focal length as a 2.5-dioptre lens.

The fact that optical powers are approximately additive enables an eye care professional to prescribe corrective lenses as a simple correction to the eye's optical power, rather than doing a detailed analysis of the entire optical system (the eye and the lens). Optical power can also be used to adjust a basic prescription for reading. Thus an eye care professional, having determined that a myopic (short-sighted)

person requires a basic correction of, say, –2 dioptres to restore normal distance vision, might then make a further prescription of 'add 1' for reading, to make up for lack of accommodation (ability to alter focus). This is the same as saying that –1 dioptre lenses are prescribed for reading.

In humans, the total optical power of the relaxed eye is approximately 60 dioptres. As humans age, the amplitude of accommodation reduces from approximately 15 to 20 dioptres in the very young, to about 10 dioptres at age 25, to around 1 dioptre at 50 and over.

Convex (+X.XX D) for hyperopia/presbyopia

Convex lenses have positive dioptric value (convergent powers) and are generally used to correct hyperopia (long-sightedness) or to allow people with presbyopia (the limited accommodation of advancing age) to read at close range.

Concave (-X.XX D) for myopia

Concave lenses have negative dioptric values (divergent powers) and generally correct myopia (short-sightedness).

Cylinder Power (CYL)

The additional power required to correct astigmatism.

Axis

The fine-tuning of angle orientation used to bring the two power (Sphere Power + Cylinder Power) corrections together in astigmatism.

Ballast

A thicker zone at the bottom of the lens to keep them from rotating during use, thereby ensuring that the axis orientation is maintained and images remain in focus.

Base Curve (BC)

This is the curvature of the back surface of the contact lens (the surface that is in contact with the eye).

The base curve number is important in order to allow the contact lens to fit well to a patient's cornea for prolonged comfort, to permit tear exchange, and to enable oxygen transmission. Base curve values are prescribed to match or complement the curvature of your cornea.

The base curve is the radius of the sphere of the back of the lens in millimetres. Typical values for a contact lens are from 8.0 (steep) to 10.0mm (shallow/flat).

Ramp Curve (RC)

The transition from the edge to the periphery (non-viewing part) of the contact lens.

Front Curve (FC)

The curvature of the front surface of the contact lens.

Centre Thickness (CT)

The thickness at the centre of the contact lens. Determines the oxygen permeability through the lens.

Edge Thickness (ET)

The thickness of the edge of the contact lens.

Peripheral Thickness (PT)

The thickness of the contact lens at the periphery (non-viewing part) of the contact lens.

Optic Zone (OZ)

The part of the contact lens that is intended to be viewed through and will be positioned over the cornea of the eye.

Diameter (DIA)

The diameter describes the width of your lens in millimetres. A soft contact lens should be about 1.5 to 2.0 millimetres larger than the measured diameter of the cornea. This should be considered when fitting the contact lenses to ensure a good fit. A lens with the wrong diameter can lead to discomfort and irritation. Typical values are 14.0 to 15.0mm, measured when the lens is hydrated.

Water Content

Eyes normally obtain their oxygen directly from contact with the air, not from the blood stream. Blood vessels are only formed, and become noticeable, when the eye is starved of oxygen, for example overnight when sleeping. If this continues for long periods, eye infections can follow.

Silicone hydrogels are the latest in a line of developments aimed at increasing the oxygen permeability (increased comfort, longer wear and better eye health), wettability (better comfort) and clinical performance of contact lenses.

Contact lens prescription

A contact lens prescription includes detailed information about your eyes to tell the lens supplier/optician what lenses best fit your eyes and what level of correction is needed to provide the best vision. A contact lens prescription is different to a glasses prescription.

Understanding a UK prescription

Most contact lens prescriptions in the UK will be displayed like the one below, or similar, not all specification will necessarily be filled in depending on what visual problem the lenses correct. Each eye is assessed separately and may require a different prescription (left = "Ocular Sinister", right = "Ocular Dexter").

Table 3 Contact Lens Prescription

	Base Curve	Diameter	Power/Sphere	Cylinder	Axis	Addition	Dominant
Left (OS)	8.6	14.2	-4.25	-1.75	100	+1.0	D
Right (OD)	8.6	14.2	-4.25	-1.75	100	+1.0	N

The prescription will normally include:

- **Power/Sphere (PWR/SPH):** Specifies the level of visual correction you need to see perfectly. A minus sign indicates that you are short-sighted and a plus sign shows that you are long-sighted.
- **Base Curve (BC):** The curvature of the lens in millimetres, which determines how well the lens fits your eye, the lower the number the steeper the curve in your cornea.
- **Diameter (DIA):** The width of your lens in millimetres.

Prescriptions for astigmatism include additional figures:

- **Cylinder (CYL):** Is an extra figure needed if you have astigmatism, it defines the level of correction needed for your astigmatism. This figure is always a minus numbers, and increases in a scale of 25 dioptres.
- **Axis (AX):** The direction needed to correct your astigmatism. This is also a number between 0 and 180 degrees.

Multifocal contact lens prescriptions also include an additional measurement:

- **Addition (ADD):** The addition determines the value of added strength needed to correct your vision when looking at objects close up. This can be either a + number between 0.50 and 3.00, or referred to as high, medium or low.
- **Dominant:** Usually displayed as a D or N to signify which eye is your Dominant eye "D" and which is the non-dominant eye "N" for multifocal/bifocal lenses.

Further information on a contact lens prescription will include:

- **Contact Lens Brand/Name:** The name of the lenses, e.g. CooperVision.
- **Expiration Date:** The date in which the lens prescription expires.

Material types

All of CooperVision's cast-moulded lenses are soft lenses, as known **Hydrogels**. Hydrogel lenses are **classified in five groups** depending on their material properties. Four of these groups are defined by the percentage of water in the lens and ionic properties of the material.

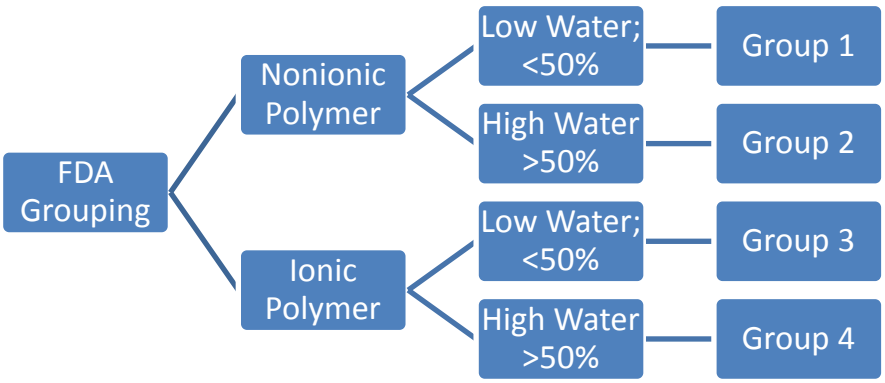

Figure 10Material Types

Oxygen Permeability (Dk)

Oxygen permeability (Dk) is the ability of the lens to let oxygen reach the eye by diffusion. Silicone has higher oxygen permeability, allowing more oxygen to pass, than water, so oxygen permeability is no longer tied to how much water is in each lens.

Oxygen Transmissibility (Dk/t)

A more common parameter quoted for contact lenses is the oxygen transmissibility (DK/t), the Dk per thickness of the lens. Where:

- **D = diffusivity (cm^2/s)** - a measure of how fast the oxygen moves through the material. Different sources may use different units: contact package inserts often use cm^2/s, while academic papers may use other values for distance such as mm^2/s.
- **k = solubility (ml O2/ml of material x mm Hg)** - a measure of how much oxygen is contained in the material. Again, different sources may use units of different sizes. Do not assume that they are the same unless specified by the source.
- **t = thickness of the lens (in mm)** – the centre thickness of the lens. Again, different sources may use units of different sizes.

Typical values for hydrogel contact lenses are from 25 to 50 and for silicone hydrogel is twice as much, from 100+.

TASK 3: Research CooperVision's products

Search the CooperVision website, and use any other resources you can think of, to gather information about CooperVision's contact lenses. List your information on the following pages.

The Line Manager must sign below to witness that the trainee has completed the task and has attained the required level of understanding and competence.

Signature (Line Manager): _____ Date: _____

Avaira family

Figure 11Avaira Family

Family members

- Avaira Asphere
- Avaira Toric

Key features

- Silicone Hydrogel with a Dk/t of 100.
- Water Content of 46%
- Aberration Controlled Asphere Design
- ISO Ballasted Toric
- UV Blocking Material

Advantages

- This material also has a high Dk/t meaning that oxygen is able to pass through the lens to the Cornea.

Disadvantages

- The Dk/t is not as high as Biofinity material.

Biofinity family

Figure 12 Biofinity Family

Family members

- Biofinity Asphere
- Biofinity XR
- Biofinity Toric
- Biofinity Multifocal

Key features

- Silicone Hydrogel with a Dk/t of 128.
- Water Content of 48%
- Aberration Controlled Asphere Design
- ISO Ballasted Toric
- Balanced Progressive Multifocal

Advantages

- As this material has a very high Dk/t oxygen is able to pass through the lens to the Cornea. This is healthier for the eye and means the lens can be wear for longer each day.

Disadvantages

- Due to the manufacturing method and raw materials requirements, these lenses are relatively expensive to manufacture.

Biomedics family

Figure 13 Biomedics Family

Family members

- Biomedics 1 Day Extra
- Biomedics 1 Day Extra Toric
- Biomedics 55 Evolution
- Biomedics Toric

Key features

- Ionic Material with a Dk/t of 19
- Water Content of 55% (Group 4 Hydrogel)
- Aberration Neutral Asphere Design
- Prism Ballasted Toric
- UV filter in Biomedics 55 Evolution & Biomedics Toric

Advantages

- Lower material and manufacturing cost compared to Proclear or Silicone lenses.

Disadvantages

- Relatively low water content and oxygen transmitability.

Frequency family

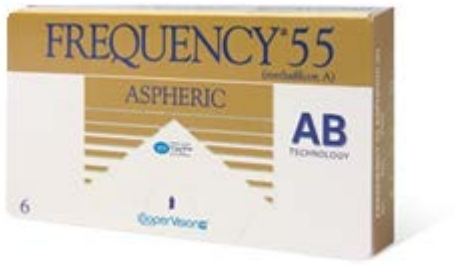

Figure 14 Frequency Family

Family members

- Frequency 55
- Frequency 55 Asphere
- Frequency Xcel Toric

Key features

- Ionic Material with a Dk/t of 19
- Water Content of 55% (Group 4 Hydrogel)
- Aberration Neutral Asphere Design
- Prism Ballasted Toric

Advantages

- Lower material and manufacturing cost compared to Proclear or Silicone lenses.

Disadvantages

- Relatively low water content and oxygen transmitability.

Proclear family

Figure 15 Proclear Family

Family members

- Proclear Asphere
- Proclear Toric (Manufactured in Puerto Rico)
- Proclear Multifocal
- Proclear Multifocal Toric
- Proclear 1 Day
- Proclear 1 Day Multifocal
- MiSight

Key features

- Non-ionic Material with a Dk/t of 25-27
- Water Content of 60-62% (Group 2 Hydrogel)
- Aberration Neutral Asphere Design
- Prism Ballasted Toric
- Balanced Progressive Multifocal – Monthly
- Transitioning Multifocal - Daily
- Myopia Control (MiSight)

Advantages

- The high water content of this lens means that it stays moist for longer making it more comfortable to wear, especially towards the end of the day.
- The manufacturing process is also relatively low cost.

Disadvantages

- The Dk/t is not as high as in Silicone Hydrogels.
- This material is also prone to tearing to needs to be handled delicately during manufacture.

Other products

List other CooperVision contact lens products:

Product specification

The following table lists the main parameters of the CooperVision products.

Table 4 CooperVision Contact Lens Specifications

Product	Base Curve	Dia	Power	Qty	Wear	Repl
Avaira	8.4/8.5	14.2	+8 to -12	6	DW	2WK
Avaira Toric .75, 1.25, 1.75, 2.25 (10º full)	8.5	14.5	+6 to -10	6	DW	2WK
Biofinity (includes XR)	8.6	14.0	+15 to -20	6	EW	1MO
Biofinity Toric .75, 1.25, 1.75, 2.25 (10º full)	8.7	14.5	+8 to -10	6	EW	1MO
Biofinity Multifocal 1.00, 1.50, 2.00, 2.50 add (N and D)	8.6	14.0	+6 to -8	6	EW	1MO
Biomedics 1 Day (=Walmart Equate)	8.7	14.2	+6 to -10	30,90	DW	1DY
Biomedics 38	8.6	14.0	Pl to -10	6	DW	2WK
Biomedics 55 UV (8.8BC on +powers)	8.6/8.8/8.9	14.2	+6 to -10	6	DW	1-2WK
Biomedics 55 Premier (8.8BC on +powers)	8.6/8.8/8.9	14.2	+6 to -10	6	FW	1-2WK
Biomedics EP Single +1.00 add only	8.7	14.4	+4 to -6	6	FW	1-2WK
Biomedics Toric .75, 1.25, 1.75, 2.25 (10º full)	8.7	14.5	+6 to -9	6	FW	2WK
Biomedics XC	8.5	14.2	+6 to -10	6	DW	2WK
ClearSight (Biomedics) 1 Day (=Walmart Equate)	8.7	14.2	+6 to -10	30,90	DW	1DY
ClearSight 1 Day Toric .75, 1.25, 1.75 (20º, 180º, 160º, 90º)1	8.7	14.5	Pl to -10	30	DW	1DY
Expressions Colors	8.7	14.4	+4 to -6	6	DW	1MO
Frequency 55 Sphere(full 0.25D steps)	8.4/8.7/9.0	14.2	+8 to -10	6	DW	1MO
Frequency 55 Aspheric (+ in 8.7bc only)	8.4/8.7	14.4	+8 to -10	6	DW	1MO
Frequency 55 Multifocal(1.00, 1.50, 2.00, 2.50 adds) N & D	8.7	14.4	+4 to -6	6	FW	1MO
Frequency 55 Toric .75, 1.25, 1.75, 2.25 (10º full)	8.4/8.7	14.4	+6 to -8	6	DW	1MO

Product	Base Curve	Dia	Power	Qty	Wear	Repl
Frequency 55 Toric XR -275 to -575 (5º full)	8.4/8.7	14.4	+6 to -8	6	DW	1MO
Hydrasoft Sphere (and Sphere Thin)	8.3/8.6/8.9/9.2	14.2/15.0	+10 to -30	4/1	DW	3MO
Hydrasoft Toric (and Toric Thin)	8.3/8.6/8.9/9.2	14.2/15.0	+30 to -30	4/1	DW	3MO
Preference Sphere	8.3,8.4,8.6,8.7	14.0,14.4	+6 to -10	4	DW	3 MO
Preference Toric 75 to 225 (5º full)	8.4/8.7	14.4	+6 to -8	4	DW	3 MO
Preference Toric XR 275 to 975 (5º full)	8.4/8.7	14.4	+6 to -9.50	4	DW	3MO
Proclear 1 day	8.7	14.2	+8 to -12	30,90	DW	1 DY
Proclear 1 day Multifocal	8.7	14.2	+6 to -10	30	DW	1 DY
Proclear EP	8.7	14.4	+6 to -8	6	DW	2WK
Proclear MultiFocal (1.00, 1.50, 2.00, 2.50 adds) N & D	8.7	14.4	+6 to -8	6	DW	1 MO
Proclear MultiFocal XR (1.00 to 4.00 adds) N & D	8.7	14.4	+20 to -20[1]	6	DW	1 MO
Proclear MultiFocal Toric 75 to 575 cyl (5º full) N & D	8.4, 8.8	14.4	+20 to -20	6	FW	1 MO
Proclear Sphere	8.2/8.6	14.2	+20 to -20[1]	6	DW	1 MO
Proclear Toric .75, 1.25, 1.75, 2.25 (10º full)	8.4/8.8	14.4	+6 to -8	6	DW	1 MO
Proclear Toric XR 0.75 to 575 cyl (5º full)[1]	8.4/8.8	14.4	+10 to -10	6	DW	1 MO
Vertex Sphere	8.3/8.6/8.8/8.9	14.2	+8 to -10	6	DW	2WK
Vertex Toric .75, 1.25, 1.75, 2.25 (10º full)	8.6	14.4	+6 to -8	6	DW	2WK
Vertex Toric XR 2.75 3.25 375 cyl (5º full)						

References

Note the following related resources and references, which are available to support you.

Documents

- Products and Processes (Powerpoint Presentation – Induction Training)
- The Human Eye (PDF- Learning & Development)

Business units

- Lens Design and Metrology Group - South Point 7 (SP7) Hamble
- Frequent Use Silicone (FUS) BU; manufacturing Avaira & Biofinity - South Point 1 (SP1), Hamble
- Single Use Silicone (SUS) BU; manufacturing MyDay - South Point 4 (SP4), Hamble
- Frequent Use Hydrogels (FUH) BU; manufacturing Proclear & Frequency monthly replacement products - South Point 4 (SP4), Hamble
- Single Use Hydrogels (SUH) BU; manufacturing Proclear Dailies and Biomedics Dailies - South Point 4 (SP4), Hamble

Personnel

Name: Becky Potts

Position/Role: TSG Team Leader

Location: Lens Design and Metrology Group

Name: Chris Williams

Position/Role: Automated Inspection Systems Engineer

Location: Controls - AIS Team

Name: Wiola Wziatek

Position/Role: Engineering Technician- Metrology

Location: Lens Design and Metrology

Review

When you have read the information and completed all the tasks provided in this training module, answer the following questions to reinforce and assess your training.

What did you learn?

By completing this training module, you learned about the following:

- the structure of the eye
- the visual anomalies of the eye
- CooperVision's contact lens families
- the strengths and weaknesses of each contact lens type
- the key parameters of a contact lens

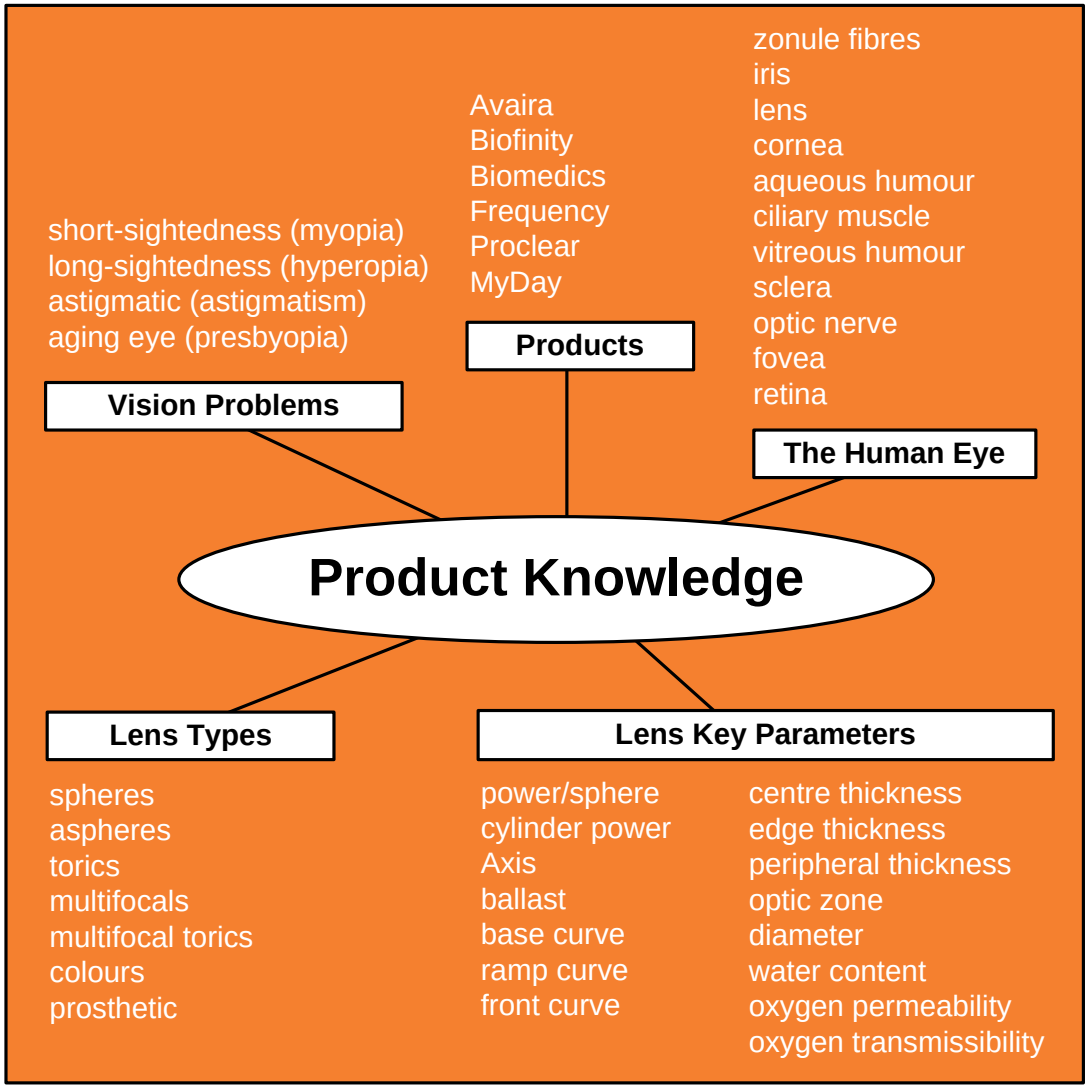

Figure 16Product Knowledge Review

Review questions

Answer the following review questions, writing your answers in the boxes provided.

Table 5 Review Questions

Review Questions	
Q1	What are the main parts of the human eye?
Q2	What are the four main vision problems of the human eye leading to blurred vision?
Q3	What are the main types of contact lens and what vision problems are they designed to assist with?

Review Questions	
Q4	What are the main families of contact lens manufactured by CooperVision?
Q5	What are the main features and key parameters of CooperVision's contact lenses?

When you have completed this module and answered the review questions, get your line manager to read and discuss your answers. You and your Line Manager should then each sign the *Training Record* to signify completion of this training module.

Notes

Use this page to add any notes or additional information about this module, such as: things you want to remember, things you want to investigate further, actions for your development plan, etc.

Training record

When you have completed the module and answered the review questions, you and your line manager should sign the form below. Please send copy of your completed form to Learning & Development.

Title	Product knowledge	Reference	LD-1000-104 Issue 01

Trainee Sign Off
Comments:
Sign below to signify that you have completed all sections of this Training Module. Signature (Trainee): _____ Date: _____

Line Manager Sign Off
Comments:
The Line Manager must sign below to witness that the trainee has completed all sections of this Training Module and has attained the required level of understanding and competence. The line manager is responsible for ensuring that the learning outcomes have been achieved and the assessment criteria have been reached. Signature (Line Manager): _____ Date: _____

Your feedback

When you have completed the module and signed the *Training record*, complete the feedback questions below. We value all your feedback, and will use it to maintain and improve our training programme. Please send copy of your completed form to Learning & Development.

Title	Product knowledge	Reference	LD-1000-104 Issue 01

Feedback Questions
1. Were all the resources and references mentioned in this module available to you?
2. What were the strengths of this training module?
3. What were the weaknesses of this training module?
4. How has this module given you an understanding of the subject matter?
5. What further training, if any, do you think you require on this subject?
6. What improvements/enhancements would you like to see made to this module?