Fitting Guide

Gas Permeable Lens

Quality lenses. Expert support.

To order, for technical support, or to request a copy of this technical guide, please contact:

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Introduction

David Thomas Contact Lenses have produced this guide as a tool for practitioners. We hope it will serve as a useful aide memoire when fitting. If you have any questions not covered by the guide, please contact the David Thomas technical support team who will be happy to help.

David Thomas have been manufacturing Gas Permeable contact lenses for over 40 years. We invest in our people, plant and processes to give practitioners excellent quality lenses, competitive prices and first-rate service. We believe it should be as easy as possible to get the right lenses for your patients, so you can focus on running your practice.

We only use materials from the leading polymer labs. You can select from an extensive range of lens designs and a custom design service is there when a standard design just isn't right. You can also take advantage of comprehensive exchange and credit facilities if you wish. All of this is backed up with technical support that is second to none. We hope you find this guide useful.

David Thomas

Your partner in Practice

MeniCare Plus, Progent and Spray and Spray & Clean provide easy to use and effective lens cleaning and care. Suitable for practice and patient use.

1 Empirical gas permeable lens fitting guide

This guide will help practitioners get the best fit and vision correction when fitting Gas Permeable lenses. You can carry out your own calculations or we can do it for you.

Lab-assisted empirical fitting (computerised Rx conversion)

If you wish to fit empirically but do not wish to perform your own calculations, David Thomas can help. Provide us with the following information and we will perform the calculations for you:

1. Keratometry 'K' readings
2. Spectacle Rx and if applicable axis
3. Vertex distance
4. Horizontal Visible Iris Diameter (HVID)
5. Material required

Practitioner empirical fitting

If you prefer to carry out the necessary calculations in your practice, you may find the following information helpful:

Base curve selection
(BOZR: Back Optic Zone Radius)

When selecting your base curve, remember:

- It's better to get an alignment or very slightly flat fitting
- The initial trial lens should have a BOZR nearest to the flattest 'K' reading
- Check alignment fitting using fluorescein
- Only judge the fluorescein pattern when the lens is centralised

The ideal pattern will show:

- alignment or light apical clearance over the central area
- mid-peripheral alignment
- edge clearance of 0.60mm width

Keratometry 'K' readings	BC Recommendation
Up to 0.15mm Toricity	0.05mm flatter than flattest 'K'
Up to 0.25mm Toricity	Flattest 'K'
Up to 0.35mm Toricity	0.05mm steeper than flattest 'K'
Up to 0.40mm Toricity	0.10mm steeper than flattest 'K'

Keratometry 'K' readings

For keratometry 'K' readings greater than 0.40mm consider using a full back toric lens. See Section 2 on toric fitting.

If the flattest 'K' reading is 7.00mm or steeper consider using a keratoconus lens design. Contact David Thomas for details of the ROSE K2 keratoconus diagnostic fitting set.

Power selection
(BVP: Back Vertex Power)

Always try to use a trial lens with a power close to the final lens power needed. If a trial lens is fitted flatter than 'K', more plus power is needed in the over-refraction due to the negative liquid lens created. If a trial lens is fitted steeper than 'K', more minus power will be required in the over-refraction.

The final BVP from your over-refraction should correlate with the patient's spectacle Rx and astigmatism once you have allowed for vertex distance.

Vertex distance does not need to be considered for any spherical power under ±3.50D.

If the spectacle Rx includes a cylinder power, calculate the BVP as shown in the table below.

If the spectacle Rx has more than ± 1.00D of cylinder power consider using a front surface cylinder. See Section 2 on toric fitting.

Spectacle Rx	Power recommendations
Spherical	Spherical power reading
± 0.25D cylinder	Spherical power reading
± 0.50D cylinder	Spherical power reading
± 0.75D cylinder	Spherical power ± 0.25D
± 1.00D cylinder	Spherical power ± 0.50D

Overall Diameter (OD) Selection

When selecting the OD of the contact lens, remember that:

- the lens diameter should be approximately 2.0mm smaller than the Horizontal Visible Iris Diameter (HVID)
- light conditions, pupil size and the vertical palpebral aperture can affect your measurements

A large total diameter is recommended as this aids lens stability.

Small diameter lenses can be used for corneas with a high degree of toricity to reduce standoff in the steep meridian or to reduce lid attachment.

Large	9.60mm to 10.00 mm diameter
Medium	9.20 mm to 9.50 mm diameter
Small	9.00 mm or less

Back Optic Zone Diameter (BOZD)

The BOZD design is usually dependent on the overall diameter; however the BOZD can be made to specific requirements if needed.

Power v Base Curve (BC) adjustments

If the trial lens is steeper than required: decrease the power by +0.25D for every 0.05 mm difference in BOZR.

Example

Trial lens	7.80 mm –3.00
Lens required	7.85 mm
Adjusted power	–2.75

If the trial lens trial is flatter than required increase the power by –0.25D for every 0.05mm difference in BCOR.

Example

Trial lens 7.80 mm –3.00

Lens required	7.75 mm
Adjusted power	–3.25

Diameter v BC adjustments

Reducing the lens diameter:

Steepen the BOZR by 0.10 mm for every 0.50 mm reduction in diameter.

Example

Existing lens	7.80/9.50/-3.00
New lens	7.70/9.00/-3.50

Increasing the lens diameter:

flatten the BOZR by 0.10 mm for every 0.50 mm increase in diameter.

Example

Existing lens	7.80/9.00/-3.00
New lens	7.90/9.50/-2.50

Remember: Steeper BOZRs require a greater change than flatter BOZRs.

Lens designs

Ledaperm

Ledaperm is a very well blended multicurve design. It gives a constant axial edge-lift of 0.12mm. and is available in standard diameters of 9.00mm or 9.60mm. Other diameters are available on request.

Ledaperm is frequently selected by practitioners due to its performance and wide parameter range. It is available in a wide range of materials to meet your patients' clinical needs.

Profile Aspheric

The Profile Aspheric design has a spherical optic zone, a progressively flattening aspheric periphery and a uniform edge thickness. This gives a lens that is easy to fit and closely follows the natural curvature of the cornea.

Other Designs

David Thomas can manufacture gas permeable lenses with base curves between 4.50mm and 9.00mm, powers +/-30.00 dioptres, diameters from 7.50mm to 12.00mm.

We are the exclusive UK manufacturer of ROSE K2 lenses for irregular corneas. ROSE K2 lenses are the most prescribed lens for keratoconus, post-surgical and irregular cornea worldwide.

Data sheets for all David Thomas lenses are available from technical support.

Lens materials

Gas permeable lenses can be manufactured from a wide range of materials including the Comfort range, Menicon, Fluorolens, Paragon, Boston, and the Optimum range.

See Section 4 for a summary of available materials. Detailed information on materials and properties can be found in the David Thomas price list.

Trial lenses

A full range of diagnostic trial sets are available on loan. "Single use" diagnostic trial lenses are available from DTCL at a reduced price. See the David Thomas price list for more information.

2 Toric fitting guide

David Thomas can manufacture front and back surface torics, bi-torics and toric periphery lenses in a wide range of materials.

A custom design service is also available to help practitioners get the correct fit and vision correction.

Front surface torics

A routine preliminary assessment should be carried out to access the patient's suitability for contact lenses. If there is refractive astigmatism without corneal astigmatism, a front surface toric should be used.

A single-use trial lens can be used to obtain the optimum fit and centration. Over-refraction can be calculated to provide sphere, cylinder power and cylinder axis. Alternatively, provide us with the following information when you place your order:

1. Back Optic Zone Radius or 'K' readings
2. Total Diameter or HVID
3. Lens design i.e. Ledaperm, C3 C4 etc
4. Material Tint
5. Amount of prism (1° to 1.5° are the standard)
6. Contact lens power or Spectacle prescription (Spec Rx)

Back surface torics

Keratometer readings should be taken in the usual way and the spectacle refraction converted to ocular prescription, by making a vertex distance adjustment. (The vertex distance should be taken into account above 4.50 dioptres).

The lens should be ordered on flattest 'K' and 0.05mm flatter than steepest 'K' in order to obtain an aligned fit.

The power should be ordered as previously explained.

Example

K's	8.00 along 180° 7.50 along 90°
Ocular Rx	-1.00/-4.00 @ 180°
Order	8.00 along 180° 7.55 along 90° -1.00D along flattest meridian -5.00D along steepest meridian

This method is usually the most successful way of fitting a back surface toric or bi-toric. Our technical support team can calculate the specifications required.

Bi Toric

A bi-toric is required when the back surface toric has created sufficient induced astigmatism (normally over 0.75D), to necessitate correction with a front surface cylinder.

Ordering Back & Bi Toric lenses empirically

The laboratory require the following information:

1. BOZR and lens design or 'K' readings
2. Back Vertex Powers expressed as powers along each meridian, or Spectacle Refraction and Back Vertex Distance (Spec Rx & BVD)
3. Horizontal Visible Iris Diameter (HVID)
4. Material and tint

Designs

Front surface toric lenses are stabilised using prism ballast, truncation or a toric periphery. The toricity of back surface and bi-toric lenses is usually enough to stabilise the lens.

Ledaperm and Profile are frequently specified for toric options.

Lens materials

Toric GP lenses can be manufactured from a wide range of materials including the Comfort range, Menicon, Fluorolens, Paragon, Boston, and the Optimum range.

See Section 4 for more information.

3 Trial sets

Trial sets are an invaluable tool in helping practitioners achieve fitting success. It is essential that trial sets are properly maintained and managed to eliminate the risk of contamination and infection.

David Thomas has a wide selection of trial lenses available on loan or for purchase. Please see the David Thomas price list for more information.

Control of Non Conventional Transmissible Agents (NCTAs)

After extensive research, the CEA* found that Menicon MeniLAB, a sodium hypochlorite solution containing a low concentration of active chlorine (0.5%) effectively controlled NCTA contamination in 5 minutes. The reference sodium hypochlorite solution with 2.0% active chlorine achieved the same level of control in one hour.

Directions for cleansing trial sets

Menicon MeniLAB provides practitioners with an effective and efficient way to decontaminate trial sets. The following cleaning and decontamination procedure is recommended:

1. After removing the trial lens, clean using MeniCare Plus cleaning solution, rubbing for at least 20 seconds. Rinse thoroughly with MeniCare Plus solution
2. Fill a vial or lens case with MeniLAB 0.5% solution and leave lens to soak for 5 minutes
3. After 5 minutes carefully rinse for 15 seconds using MeniCare Plus multi-purpose solution
4. Store lens in MeniCare Plus solution until next used
5. Before fitting, rinse again with MeniCare Plus solution (repeat step 4)

MeniLAB provides a fast, effective method to decontaminate fitting sets.

* Commissariat à l'Energie Atomique (CEA), Neurovirology Lab, Professor Dominique Dormont. Study 277111: Evaluation of the efficacy of protocols for disinfection of rigid gas-permeable contact lenses through inactivation and/or removal of Transmissible Spongiform Encephalopathy (TSE, Prions) agents.

Published in J.Fr.Ophtalmol. 2003; 26, 3,233-239. (Copies available upon request).

Precautions

- Do not use for soft lenses
- The soaking time in MeniLAB 0.5% solution must not exceed one hour (discolouration of the lens may occur)
- It is essential to rinse the lenses abundantly with a proprietary rinsing solution after soaking in MeniLAB 0.5% solution
- DO NOT put the solution directly in the eye. Avoid splashing on to clothing
- Do not swallow
- Store at room temperature (up to 25° C)
- Use within 3 months after opening. Note the expiry date
- Never use tap water for contact lens rinsing

Traceability

A traceability document should be completed to record date, patients name, batch number, lens parameters, trial set used, etc.

All DTCL trial lenses are managed using these protocols.

Single patient use trial lenses are available.

All trial lenses are strictly NOT FOR RESALE.

Safety Data Sheet (EC regulations 91/155/EEC/COSHH) is available upon request.

4 Materials guide

We offer a wide range of materials which combined with an extensive choice of designs allows the practitioner to select the best combination to suit all clinical needs in Gas Permeable lens wear.

Our technical team is always available to discuss specific patient requirements with you and can recommend a suitable material or design.

Call us on +44 (0)1604 646 216 or email technicalsupport@davidthomas.com.

GP Materials	Dk	Blue	Grey	Green	Clear	Other
Boston EO + uv	58	●	●	●		Brown
Boston ES + uv	18	●	●	●		Brown
Boston Equalens	47	●				Electric Blue
Boston Equalens II	85	●				
Boston IV Silicone acrylate non-uv	19	●				
Boston XO + uv	100	●		●		Violet
Boston XO2 + uv	141	●		●		Violet
Comfort DR + uv	26	●	●			
Comfort GP + uv	56	●	●			
Comfort HO High Oxygen + uv	97	●		●		Dark Blue
Fluorolens 25 non-uv	26	●	●	●	○	
Fluorolens 50 non-uv	56	●	●	●	○	
Fluorolens 90 non-uv	102	●	●		○	
Fluoroperm 30 + uv	30	●	●	●		Majestic Blue
Fluoroperm 60 + uv	60	●		●		
Fluoroperm 90 + uv	92	●		●		
Fluoroperm 151	151	●				
Hybrid FS non-uv	31	●	●	●	○	
Menicon EX + uv	85	●				
Menicon Z + uv	189	●				
Optimum Classic + uv	26	●	●	●		Violet
Optimum Comfort + uv	65	●	●	●		
Optimum Extra + uv 100	100	●	●	●		
Optimum Extreme + uv	125	●	●	●		
Paragon HDS + uv	58	●		●		
Paragon HDS 100 + uv	145	●		●		
PMMA	0	●	●	●	○	Brown

5 Conversion tables

Vertex distance conversion

minus -		Spec Rx	plus +	
10mm	12mm	Dioptres	10mm	12mm
-3.75	-3.75	4.00	+4.25	+4.25
-4.00	-4.00	4.25	+4.50	+4.50
-4.25	-4.25	4.50	+4.75	+4.75
-4.50	-4.50	4.75	+5.00	+5.12
-4.75	-4.75	5.00	+5.25	+5.37
-5.00	-5.00	5.25	+5.50	+5.62
-5.25	-5.12	5.50	+5.87	+5.87
-5.37	-5.37	5.75	+6.12	+6.12
-5.62	-5.62	6.00	+6.37	+6.50
-5.67	-5.87	6.25	+6.62	+6.75
-6.12	-6.00	6.50	+7.00	+7.00
-6.37	-6.25	6.75	+7.25	+7.37
-6.50	-6.50	7.00	+7.50	+7.62
-6.75	-6.62	7.25	+7.87	+8.00
-7.00	-6.87	7.50	+8.12	+8.25
-7.25	-7.12	7.75	+8.37	+8.50
-7.37	-7.25	8.00	+8.75	+8.87

minus -		Spec Rx	plus +	
10mm	12mm	Dioptres	10mm	12mm
-7.62	-7.50	8.25	+9.00	+9.12
-7.87	-7.75	8.50	+9.25	+9.50
-8.00	-7.87	8.75	+9.62	+9.75
-8.25	-8.12	9.00	+9.87	+10.12
-8.50	-8.37	9.25	+10.25	+10.37
-8.62	-8.50	9.50	+10.50	+10.75
-8.87	-8.75	9.75	+10.75	+11.00
-9.12	-8.87	10.00	+11.12	+11.37
-9.50	-9.37	10.50	+11.75	+12.00
-9.87	-9.75	11.00	+12.37	+12.62
-10.37	-10.12	11.50	+13.00	+13.37
-10.75	-10.50	12.00	+13.62	+14.00
-11.12	-10.87	12.50	+14.25	+14.75
-11.50	-11.25	13.00	+15.00	+15.37
-11.87	-11.62	13.50	+15.62	+16.12
-12.25	-12.00	14.00	+16.25	+16.87
-13.00	-12.75	15.00	+17.62	+18.25

Dioptre to mm conversion

Dioptre to mm conversion			
Dioptres	mm	Dioptres	mm
53.75	6.28	50.00	6.75
53.50	6.31	49.75	6.78
53.25	6.34	49.50	6.82
53.00	6.37	49.25	6.85
52.75	6.40	49.00	6.89
52.50	6.43	48.75	6.92
52.25	6.46	48.50	6.96
52.00	6.49	48.25	6.99
51.75	6.52	48.00	7.03
51.50	6.55	47.75	7.07
51.25	6.58	47.50	7.11
51.005	6.62	47.25	7.14
50.75	6.65	47.00	7.18
50.50	6.68	46.75	7.22
50.25	6.72	46.50	7.26

Dioptre to mm conversion			
Dioptres	mm	Dioptres	mm
46.25	7.30	42.50	7.94
46.00	7.34	42.25	7.99
45.75	7.38	42.00	8.04
45.50	7.42	41.75	8.08
45.25	7.46	41.50	8.13
45.00	7.50	41.25	8.18
44.75	7.54	41.00	8.23
44.50	7.58	40.75	8.28
44.25	7.63	40.50	8.33
44.00	7.67	40.25	8.39
43.75	7.71	40.00	8.44
43.50	7.76	39.75	8.49
43.25	7.80	39.50	8.54
43.00	7.85	39.25	8.60
42.75	7.89	39.00	8.65