FITTING GUIDE

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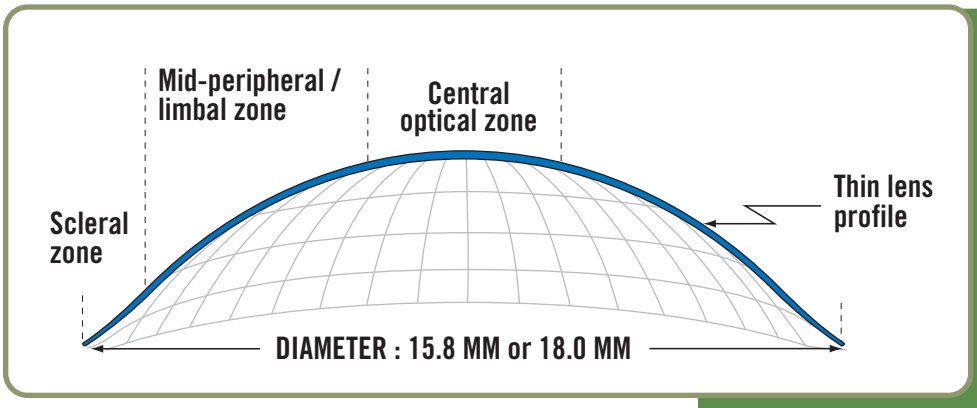
msd Select tm

INTRODUCTION

The **msd** ***Mini-Scleral Design*** design has a distinctive posterior lens surface incorporating reverse geometry with specially designed optical and posterior curves. The **msd**'s profile curve generates the front surface of the tear layer that forms between the cornea and **msd** lens. It is this smooth refracting surface that eliminates much of the irregular and regular astigmatism caused by the corneal surface. The **msd**'s aspheric front surface optics reduces aberrations further improving vision. The **msd** thinner profile and design results in minimal lens edge/lid interaction, providing excellent patient comfort. The thinner lens profile combined with the high oxygen permeability of Boston XO and Boston XO2 materials allow maximum oxygen transmission, maintaining corneal health.

The **msd** is easy to fit and is suitable for anterior segment pathology cases ranging from dry eyes, advanced Keratoconus to post Lasik and other compromised and irregular corneas on which fitting corneal contact lenses has not lead to optimal results.



APPLICATIONS

Applications for the **msd** lens are numerous and include the majority of pathology cases such as:

- **Keratoconus (Oval, Nipple)**
- **Pellucid Marginal Degeneration**
- **Keratoglobus**
- **Post Graft**
- **RK, PRK and LASIK induced ectasia**
- **Any compromised and/or irregular cornea**
- **Dry Eyes**

CHARACTERISTICS

1. The **msd** lens always centers well.
2. Due to the proprietary, reverse geometry designs, the sagittal depth of the lens can be changed independent of central optic zone profile and/or mid-peripheral/limbal zone clearance values.
3. Sagittal depth value, mid-peripheral/limbal zone clearance, edge clearance, lens material, and lens power are the only parameters to specify when ordering the **msd** lens.
4. The **msd** lens is available in two modalities: Fenestrated & Non Fenestrated. Both modalities will be simultaneously addressed throughout this guide.

   Fenestrated sets: require closer alignment and some vaulting. A fenestration in the lens acts as a controlled release valve for tear exchange and the flow of metabolic debris.

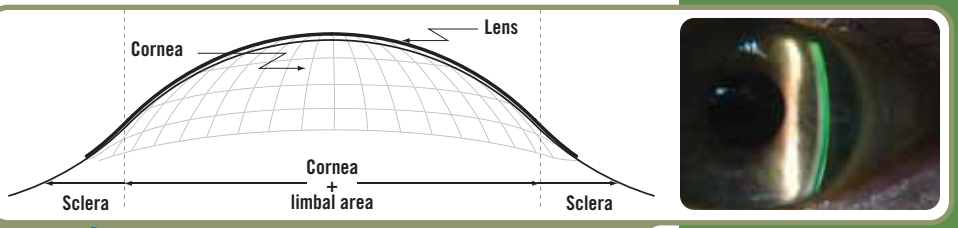
   Non fenestrated sets: require complete corneal and limbal vaulting. Vaulting dimensions can easily be estimated in micron clearances using a cross section slit-lamp analysis.
5. The proprietary mid-peripheral hinge in the **msd** lens design creates a unique tear pump, which is present in both fenestrated and non fenestrated lens sets, providing enhanced tear exchange.
6. The thinner profile maximizes DK over L with Boston XO and XO2 materials. Our exclusive edge design results in minimal lens edge/lid interaction, providing excellent comfort.

FITTING PHILOSOPHY

A fundamental principle of GP contact lens fitting is to achieve a particular relationship between the posterior lens surface and the anterior cornea, thus creating a tear layer with specific characteristics. This is also true in fitting the **msd** lens with some differences when compared to corneal lens designs.

Corneal lenses are fitted by manipulating base curve and diameter in order to create the optimal lens/cornea relationship. When the cornea becomes highly irregular with steep and flat areas arbitrarily placed, the fit becomes very complicated and often impossible.

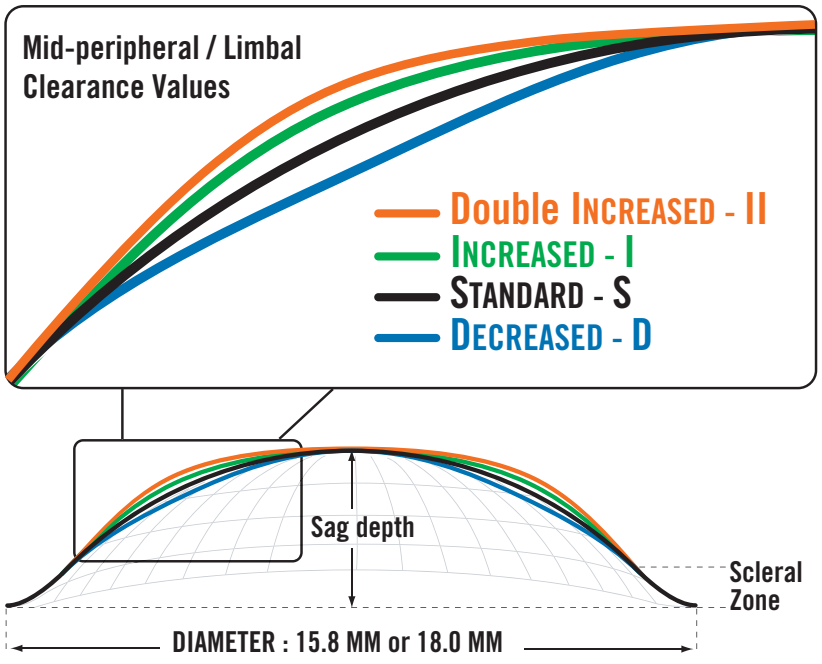
The underlying principle of the **msd** lens is **not to rely on or use the highly irregular cornea but rather vault it as well as the limbus, and use the sclera as the landing area** to properly position the posterior surface of the lens over the highly irregular cornea and recreate a smooth spherical second refractive surface. With this in mind, sagittal depth (see section on sagittal depth), as opposed to base curve and diameter, becomes the most comprehensive and easiest measurement in managing and optimizing the vaulting characteristics of **msd** lenses *(see illustration below).*



*The **msd** lens, vaults the cornea as well as the limbus and uses the sclera as the landing area.*

MID-PERIPHERAL / LIMBAL ZONE

After determining the msd with the ideal sagittal depth value, the lens fitter selects the Profile Curve that provides the preferred lens vault in the mid-peripheral and limbal clearance zone. There are 4 Profile Curves available: **Decreased** - D, **Standard** - S, **Increased** - I, and **Double Increased** - II.



Independent of the sagittal depth value, the mid-peripheral/limbal zone of the lens can be specified with either Standard, Increased, Double Increased or Decreased clearance values.

MINIMAL FITTING VARIABLES TO DETERMINE

The **msd** fitting concept is simple and easy to grasp. You are only a few variables away from making a difference in someone's life! First, determine the sagittal depth value, then, specify the mid-peripheral/limbal zone clearance value, specify edge clearance - (standard, 1 flat, 2 flat), and finally over-refract for the final lens power.

IDEAL FIT

WHEN USING THE FENESTRATED DESIGN:
Ideally, a closer alignment is required.
WHEN USING THE NON FENESTRATED DESIGN: Ideally, the **msd** should fit with apical clearance approximately between 200/600 microns.
FOR BOTH MODALITIES: the mid-peripheral/limbal zone should completely vault the limbus and align on the sclera. Lens movement with the **msd** is often very limited and may be difficult for the practitioner to discern.

PARAMETERS AVAILABLE Diameter 15.8mm and 18.0mm

LENS DIAMETER	SAGITTAL DEPTH VALUE	MID-PERIPHERAL/ LIMBAL ZONE CLEARANCE	LENS POWER	EDGE CLEARANCE
15.8mm **msd**	3.60mm to 5.80mm (0.10mm inc.)	Decreased - **D** Standard - **S** Increased - **I** Double Increased - **II**	Any	STANDARD 1 - Flat 2 - Flat
18.0 mm **msd**	3.60mm to 5.80mm (0.10mm inc.)	Decreased - **D** Standard - **S** Increased - **I** Double Increased - **II**	Any	STANDARD 1 - Flat

DIAGNOSTIC LENSES Diameter 15.8mm and Plano Powers

Fitting sets are available in non fenestrated and fenestrated designs. Using the non fenestrated set is strongly recommended.

The non fenestrated set is composed of 30 lenses as follows:

10 sag depth values ranging from 3.80mm to 5.60mm in 0.20mm steps (200 microns), each having 3 mid-peripheral/limbal zone clearance values (Standard, Increased and Decreased), with standard edge clearance.

The fenestrated set is composed of 36 lenses as follows:

12 sag depth values ranging from 3.70mm to 4.80mm in 0.10mm steps (100 microns), each having 3 mid-peripheral/limbal zone clearance values (Standard, Increased and Decreased), with standard edge cleanrance.

Diagnostic lenses are clearly marked with sagital depth value as well as mid-peripheral/limbal zone clearance value.

SUMMARY FITTING GUIDE

Trial fitting with an **msd** diagnostic lenses **is critical**.
msd lenses of known parameters will establish the initial fitting relationship.
All diagnostic lenses are clearly identified as to its sag depth as well as mid-peripheral/limbal clearance values.

msd Select tm
Fits the Challenge

Advanced Keratoconus (Oval, Nipple) PMD, Globus. Steep K readings above 50.00D	Moderate Keratoconus (Oval, Nipple) PMD, Globus. Moderate K readings between 42.00D and 50.00D	Post Graft, LASIK, RK, PRK traumatic cornea. Evaluate corneal profile

1 SELECT INITIAL SAG DEPTH VALUE

4.60 S (standard)	4.40 S (standard)	4.20 S (standard) Required SAG may be higher or lower depending on profile

2 EVALUATE CENTRAL FIT

Ignore mid-peripheral/limbal fit at this stage. **Fenestrated lens:** allow the lens to vault the entire cornea, having a closer alignment fit. **Non fenestrated lens:** allow the lens to vault the entire cornea, approximately 200 to 600 microns clearance. In the case of central bubbles, not insertion bubbles; lower the sag depth. If touch occurs; increase the sag depth.	Ignore mid-peripheral/limbal fit at this stage. **Fenestrated lens:** allow the lens to vault the entire cornea, having a closer alignment fit. **Non fenestrated lens:** allow the lens to vault the entire cornea, approximately 200 to 600 microns clearance. In the case of central bubbles, not insertion bubbles; lower the sag depth. If touch occurs; increase the sag depth.	Ignore mid-peripheral/limbal fit at this stage. **Fenestrated lens:** allow the lens to vault the entire cornea, having a closer alignment fit. **Non fenestrated lens:** allow the lens to vault the entire cornea, approximately 200 to 600 microns clearance. In the case of central bubbles, not insertion bubbles; lower the sag depth. If touch occurs; increase the sag depth.

Immediately after applying lens to the eye, evaluate to insure complete corneal vaulting has been achieved using a slit-lamp cross section analysis.
Allow lens to settle for an additional 20 minutes, then be sure there is still ample vaulting as the lens will continue to settle with a few hours of wear.

3 EVALUATE MID-PEREPHERAL/LIMBAL FIT

There should be limbal clearance with a slight pool of tears (no less than 100 microns) in the mid-peripheral zone (bright fluorosceine band). In case of touch; increase clearance and/or sag. In case of bubble formation in the mid-periphery try the decreased profile trial lens.

4 SCLERAL/EDGE FIT

Look for scleral alignment. If there is too much edge clearance (peripheral bubbles), try increasing sag depth. If there is scleral impingement, try flattening the PC, or increasing the profile curve, or both.

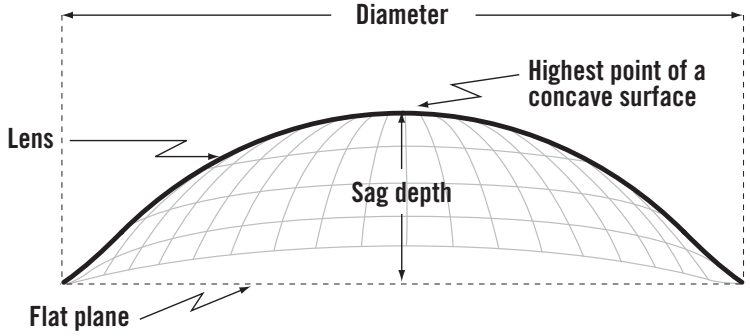
5 ASSESS POWER

Perform over-refraction in normal light conditions. Start by using ± 1.00D steps and refine with 0.25D steps.

Note : When the best possible vault has been achieved with the non fenestrated lens but bubbles have formed and appear stagnant, remove the lens and re-insert the lens (this is most likely insertion bubbles).
With the fenestrated lens, try closer aligning , making sure these are not insertion bubbles

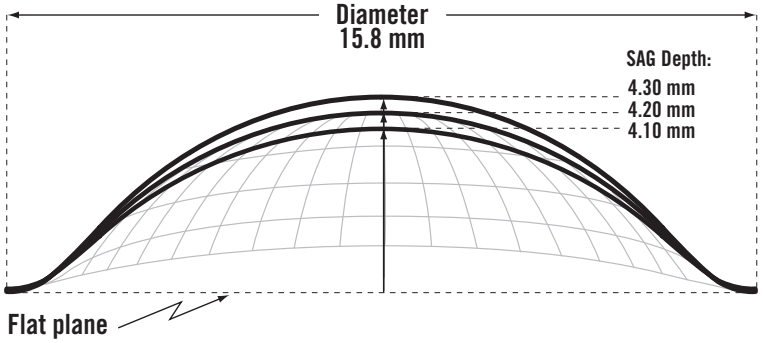
WHAT IS SAGITTAL DEPTH (sag depth)

Sagittal depth (sag depth) is the measurement from the flat plane at a given diameter to the highest point of a concave surface of the contact lens - also described as the degree of corneal elevation for a given chord diameter.



HOW DOES SAGITTAL DEPTH EFFECT THE FIT?

Sag depth value is critical in achieving the desired fit as it serves as a control mechanism for not only completely vaulting but also controlling the **desired thickness of the tear layer**.



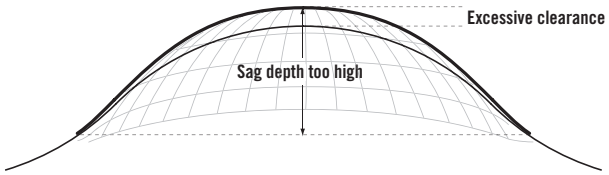
HIGHER sag depth values allow more vaulting, conversely, LOWER sag depth values will increase positive pressure.

TROUBLESHOOTING

TEAR MENISCUS AND BUBBLE FORMATION

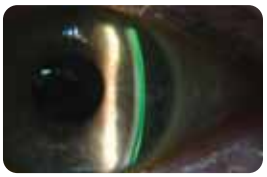
Bubbles underneath the lens will form when the tear meniscus breaks up due to too much clearance between the cornea and/or sclera and the posterior surface of the lens. The location and size of the bubbles will dictate which lens parameter needs to be modified. To reduce this excessive clearance, create a closer alignment. With non fenestrated lenses, vaulting up to 600 microns is acceptable. If bubbles creep in after insertion, reduce the tear layer where needed.

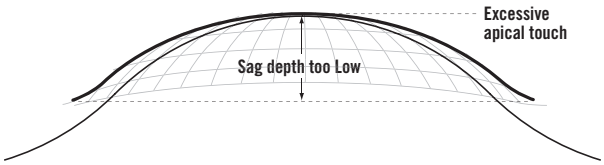
Bubbles in the central zone of the lens are indicative of a sag depth value that is too high. Lower the sag depth value in this case.



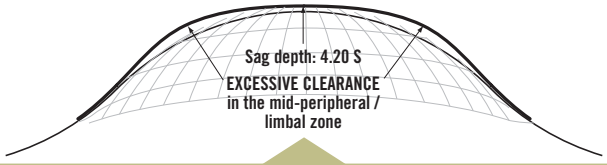
If the sag is too low, the lens rests on the cornea and bubbles may appear in the scleral or mid-peripheral/limbal zone - increase the sag depth value by 200 microns. A lens resting on the limbus is not only uncomfortable, but may not settle well enough on the conjunctiva and bubbles may appear in the peripheral area - increase mid-peripheral/limbal clearance value. At all times vault the cornea and the limbal area. For non fenestrated lenses; centrally, 200 microns to 600 microns clearance is preferred. For fenestrated lenses; centrally 100 microns to 200 microns is preferred although success can be achieve with less clearance in both fenestrated and non fenestrated lenses.

Although slight apical or feather touch is sometimes desired with Keratoconus, avoid no clearance as this will not allow the lens to land and align on the sclera properly. Bubbles in the scleral zone of the lens are indicative of a sag depth value that is too low. Increase the sag depth value in this case.





When the proper sag depth value has been determined to correctly vault the cornea but bubbles persist in the mid peripheral/ limbal zone; keeping the sag depth value the same, select a lens with a decreased mid-peripheral/limbal zone clearance.

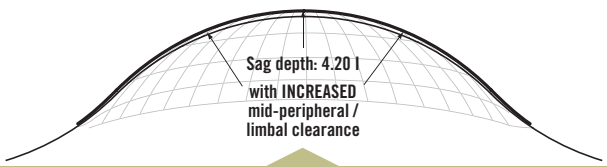


Excessive mid-peripheral/ limbal zone clearance will invite the formation of bubbles in that area.

Ordering a lens of the same sag depth value but with decreased mid-peripheral/limbal zone clearance (in this example, from 4.20S to 4.20D), will eliminate the bubbles.

Conversely, if the correct sag depth value creates excessive mid-peripheral/ limbal zone touch; select a lens of the same sag depth value with increased mid-peripheral/limbal zone clearance.

Excessive touch in the mid-peripheral/limbal zone, as evidenced by a lack of fluoresceine in that area.



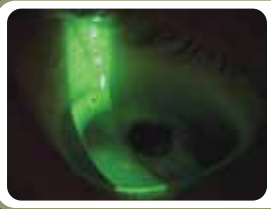
Ordering a lens of the same sag depth value but with increased mid-peripheral/limbal zone clearance (in this example from: 4.20S to 4.20I) will provide the necessary clearance.

CONJUNCTIVAL IMPINGEMENT

When conjunctival impingement occurs, showing excessive blanching; order a lens with a flatter edge, 1 flat or 2 flat (depending on diameter) or increase the profile or increase sag, or depending on severity, consider all three options simultaneously

FENESTRATION OR NOT?

Due to some extreme irregular corneal shapes, alignment of the lens is difficult and sometimes impossible therefore, bubbles may constantly occur with the fenestrated lenses. **Non fenestrated lenses allow the fitter an easier and simpler fit. As a result, more practitioners opt for non fenestrated lenses.**



When using fenestrated trial lenses, if you have difficulties determining the best possible sag depth value due to the presence of bubbles, reinsert the diagnostic lens with the fenestration tucked under the upper lid. This prevents air from entering temporarily, giving you enough time to diagnose the proper sagittal depth value.

Note: Small bubbles that move around, providing they do not cross the pupil are acceptable. Bubbles that remain and are fairly stationary are not.

Some lenses without fenestration may need to be removed for cleaning during the patient's wearing schedule, as metabolic debris could migrate to the centre of the lens. Keep in mind the unique tear pump (hinge) will keep this to a minimum.

INSERTION BUBBLES

Due to the large diameter of the lens, insertion bubbles are not uncommon with fenestrated lenses, but should subside as the lens settles in. To avoid insertion bubbles with both fenestrated and non fenestrated lenses, ensure that the posterior surface of the lens is completely filled with the proper solution prior to insertion, and the patient with his/her head parallel to the floor, immerses his/her eye into the bowl of saline.