

VARILUX® FITTING GUIDE



**GUIDELINES FOR SUCCESSFULLY
FITTING VARILUX® LENSES**



WELCOME

We are pleased to present this guide which outlines the essential steps for **successfully fitting progressive lenses** to your presbyopic patients.

Overall, it guides you through successful fitting from first contact to the delivery of the glasses.

This guide will be useful in your daily routine. It will help you professionally fit progressive lenses and help **to improve patient satisfaction.**

Please use it regularly!



FITTING VARILUX STEP BY STEP



1 UNDERSTANDING THE PATIENT P. 7

2 ANALYZING THE PRESCRIPTION P. 9

3 FRAME SELECTION P. 17

4 TAKING THE MEASUREMENTS P. 19

5 MOUNTING THE LENSES P. 23

6 DELIVERING THE EYEGLASSES P. 25

7 SOLVING ADAPTATION PROBLEMS P. 27

1 UNDERSTANDING THE PATIENT

This first step is essential to the success of lens fitting

1 What was the patient wearing before?

Type of lenses worn

- Single Vision for Distance, Single Vision for Near, Mid-distance, Bifocal, Progressive (brand and type)...
- Material, color, coatings...

Analyzing the previous lenses

- Measure the previous correction: sphere, cylinder, axis, addition and prismatic correction if any.
- Date when given the previous lenses
- Visual performance with former lenses: measure acuity for distance and near vision.

Understand the reasons for any lens change and confirm its need.

2 What are the visual needs?

What are the glasses used for?

- Permanent or occasional?
- Working distances?

Specific requirements?

- Profession, hobbies, leisure?
- Clarity of vision necessary?
- Field of vision needed?



2 ANALYZING THE PRESCRIPTION

An overview of the refraction techniques

1 Compare the new prescription with the previous one

If the difference is equal to (or more than) ...

- 0.75 D on the sphere
- 0.50 D on the cylinder
- 10° on the axis
- 0.75 D on the addition

... confirm its necessity and ensure its acceptance to tolerance.

2 Compare the value of the addition with the ones suggested in the table

These typical values should only be exceeded in cases of real necessity.



Age	Addition
40 years	0.75 D
44 years	1.00 D
47 years	1.25 D
49 years	1.50 D
51 years	1.75 D
54 years	2.00 D
58 years	2.25 D
63 years	2.50 D
67 years	2.75 D
70 years	3.00 D
75 years	3.25 D*
80 years	3.50 D*

* Additions +3.25 and +3.50 should rarely be prescribed.

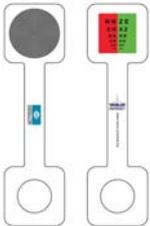
CHECK THE ADD AND MAKE SURE IT'S NOT TOO STRONG

Too strong an addition is often the reason for adaptation problems with progressive lenses

1 Check near vision correction

Using the Essilor "CheckTest"

The patient wearing the near vision correction, places the CheckTest at the usual reading distance.



- With the red-green test

If the letters are seen more clearly on the green background, the near vision correction is right or insufficient. If they are seen more clearly on the red background, the near vision correction is probably excessive.



- With the Helmholtz test pattern

If the circles in the center of the pattern are seen without deformation, the near vision correction is correct for the reading distance. If the circles are seen deformed, the near vision correction is insufficient or excessive.

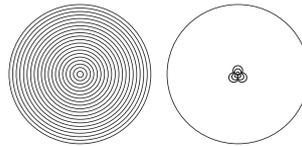


Image of pattern's center



With an additional power of -1.00 D

Place the -1.00 D lenses in front of the near vision correction of the patient: if the smallest characters can still be read, even if with difficulty, the addition is probably too strong.

The CheckTest is available at no charge from Varilux University. Visit our web site at : www.varilux-university.org



CHECK THE ADD AND MAKE SURE ITS NOT TOO STRONG

Too strong an addition often results from an under-correction of distance vision

2 Detecting under-corrected hyperopia

This is often the cause of too strong an addition because it relates directly to the value of the addition.

With the red-green test in distance vision

If the patient has a clear preference for reading on the green background and the letters appear blurred on the red background, the hyperopia is probably under-corrected.

Note : any prescription changes or prescriptive evaluations of visual acuity must be undertaken by a licensed prescriber.



With an additional power of + 0.50 D

Place the + 0.50 D lenses in front of the distance vision correction of the patient and ask the patient to look in the distance: if vision remains clear, or is improved, the hyperopia is probably under-corrected.



CORRECTION OF DISTANCE VISION

An accurate distance prescription results in the most comfortable near prescription

Deal with each eye separately starting from a trial correction (old prescription or results from an autorefractor).

1 Determination of the sphere

Using the fogging method

- 1) Place the trial prescription before the patient's eye and measure the visual acuity.
- 2) Fog the eye by adding +1.00 D or +1.50 D to cause a drop in visual acuity.
- 3) Unfog progressively by -0.25 D steps and check that the visual acuity improves.
- 4) Continue until the best acuity is obtained.
- 5) Record the power of the strongest plus sphere that provides maximum acuity.

2 Determination of the cylinder

Using the cross cylinder method (± 0.25 D)

a) Verify the cylinder axis:

- Position the handle of the cross cylinder along the cylinder axis direction of the trial prescription (it should produce a drop in acuity).
- With the patient looking at a line of medium size letters, rapidly twirl the cross cylinder and ask the patient which position of the cross cylinder is preferred.
- Turn the axis of the correcting minus cylinder by 5° towards the minus axis of the preferred cross cylinder.
- Repeat this process until the patient barely discerns the difference.



b) Verify the cylinder power

- Place the minus axis of the cross cylinder along the direction of the correcting minus cylinder.
- With the patient looking at a line of small letters, rapidly twirl the cross cylinder and ask the patient which position of the cross cylinder is preferred.
- If the patient prefers the position when the minus axis of the cross cylinder lies along the axis of the correcting minus cylinder, add -0.25 D to the correcting cylinder.
- Repeat this process until the patient barely discerns the difference.
- Record the minimum value of the cylinder power found.

c) Check the sphere power

- Add +0.25 D to the sphere by -0.50 D added to the cylinder and check that the best visual acuity is still obtained.

CORRECTION OF DISTANCE VISION

An accurate distance prescription results in the most comfortable near prescription

3 Binocular balance

In distance vision, by disassociating the eyes and checking the visual acuity.

1) Disassociate the patient's eyes

- by alternate occlusion : rapidly occlude one eye, then the other, with an occluder *or*
- with vertical prism : introduce 3Δ base down before one eye and 3Δ base up before the other *or*
- by polarization : use a polarization test for visual acuity together with the corresponding polarizing filters.

2) Fog both eyes with +0.50 D spheres and confirm that there is a drop in acuity.

3) Balance vision in the right and left eyes by refogging the eye with the better acuity with a +0.25 D sphere.

4) Binocularly, unfog the eyes in -0.25 D steps until the maximum acuity is obtained.

5) Check the acuity of each eye, making sure that ocular dominance has not been reversed between the eyes.

Some rules and recommendations

■ For the sphere

- Always fully correct the ametropia, particularly any hyperopia, but do not over-plus.
- Do not over-correct, a slight under-correction is preferred. In the red-green test:
 - for hyperopia, “equalize” the red and the green or leave “slightly clearer on the green”.
 - for myopia, “equalize” the red and the green or leave “slightly clearer on the red”.
- Remember that refraction has not been undertaken for infinity : add -0.25 D to the sphere if necessary.

■ For the cylinder

- Correct the astigmatism only if it results in a noticeable gain in visual acuity.
- Be wary of weak astigmatism, it often varies.
- Moderate prescriptions with oblique axes that may give rise to distortion.

■ Binocular vision

- Carefully check bi-ocular balance.
- Give priority to the dominant eye : do not reverse ocular dominance between the eyes.
- In cases of anisometropia, give the minimum possible difference between the right and left eyes.

■ As a general rule

- Avoid large changes in prescription : do not exceed 0.75 D on the sphere, 0.50 D on the cylinder or 10° on the axis, unless it is necessary.

DETERMINATION OF THE ADDITION

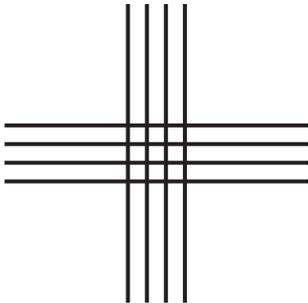
THE “FIXED CROSS CYLINDER” METHOD

A reference method for determination of the addition

Using the refractor with both eyes open.

1 Fully correct distance vision

Use the highest plus sphere which provides maximum visual acuity (see previous pages on “Correction of Distance Vision”).



2 Determination of the addition

- Ask the patient to fixate a cross made up of vertical and horizontal lines at a distance of 40 cm / 16 in.
- Position ± 0.50 D cross cylinders with their minus axes at 90° before both eyes : the patient should report that the horizontal lines are clearer.
- Progressively, place +0.25, +0.50, +0.75 D... lenses before the eyes until the vertical and horizontal lines appear equally black.
- The addition is the value which gives the best equality between the horizontal and the vertical lines.

3 Verify that the subject can read comfortably

- Put up the distance correction with the proposed near addition in a trial frame.
- Ask the patient to confirm that vision is comfortable when reading.
- Adjust the value of the addition for the patient's normal working or reading distance.



DETERMINATION OF THE ADDITION THE “ACCOMMODATIVE RESERVE” METHOD

A classic method for determination of the addition

1 Measure the amplitude of accommodation

Using binocular vision with the distance correction in place and the use of a near vision chart.

■ With moveable near vision chart:

Bring the near vision chart in towards the patient until it is only just legible, the amplitude of accommodation is the reciprocal of this distance.

For example: nearest reading distance = 0.50 m,
amplitude of accommodation = 2.00 D.

■ With fixed near vision chart:

- Position the near chart at 40 cm / 16 in and ask the patient to read.
- If he/she can read the smallest text, add -0.25 D, -0.50 D etc..., binocularly, until reading is no longer possible.
- If he/she cannot read the smallest text put up +0.25 D, +0.50 D etc..., binocularly, until the smallest text can barely be read.

The amplitude of accommodation =
2.50 - final value which has been added.

2 Determine the addition

Normally, patients should be allowed to use two-thirds of their total amplitude of accommodation at their usual working distance (leaving one-third of their total amplitude in reserve) so as to be comfortable.

The addition is calculated from :

Addition = 1 / near distance - 2 / 3 total amplitude.

Total amplitude of accommodation	Usable amplitude of accommodation	Addition for 40 cm / 16 in
3.00	2.00	0.50
2.75	1.75	0.75
2.50	1.50	1.00
2.25	1.50	1.25
2.00	1.25	1.50
1.75	1.00	1.50
1.50	1.00	1.50
1.25	0.75	1.75
1.00	0.50	2.00
0.75	0.50	2.25
0.50	0.25	2.50

3 Verify that the patient can read comfortably

- Put the distance correction with the proposed near addition in a trial frame.
- Ask the patient to confirm that vision is comfortable when reading.
- Adjust the value of the addition for the patient's normal working or reading distance.



DETERMINING THE ADDITION THE “MINIMUM ADDITION” METHOD

A simple and proven method of determining the addition

4 Stages

1 Good correction of distance vision

- Fully correct the ametropia, in particular any hyperopia.
- Do not over-correct.
With the red-green test:
 - for the hyperope, keep “equal” or “sharper on the green”,
 - for the myope, keep “equal” or “sharper on the red”.
- Correct astigmatism as long as it provides a real gain in visual acuity.

2 Determining the minimum addition at 40 cm / 16 in

For this, add binocularly + 0.25 D, + 0.50 D, etc... to the distance correction until the patient just barely distinguishes the smallest characters: the value found is the minimum addition.

3 Add + 0.75 D to + 1.00 D

To the minimum addition to find the comfortable addition value.

4 Checking the patient's visual comfort

- Have the patient evaluate whether reading is comfortable with the addition found.
- Ask the patient to bring the text closer until the reading of small characters is impossible: it should occur at approximately 25 cm / 10 in from the eyes. If it occurs closer than 20 cm / 8 in, the addition is too strong, if the distance is further than 30 cm / 13 in, the addition is too low.
- Adjust the value of the addition by 0.25 D according to the usual working or reading distance.



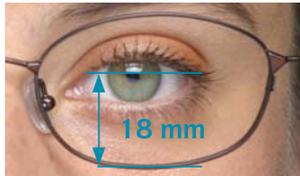
3 FRAME SELECTION

The correct choice of frame is important for overall comfort

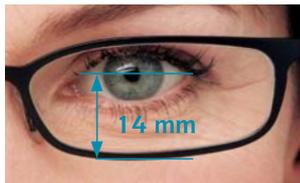
1 Selecting the frame

Select a frame which is right for the wearer's face; it should rest on the nose with stability and offer sufficient height between the pupil and the lower rim of the frame.

18 mm minimum for Varilux Panamic,
Varilux Comfort and Varilux Ipseo



14 mm for Varilux Ellipse



2 Adjusting the frame

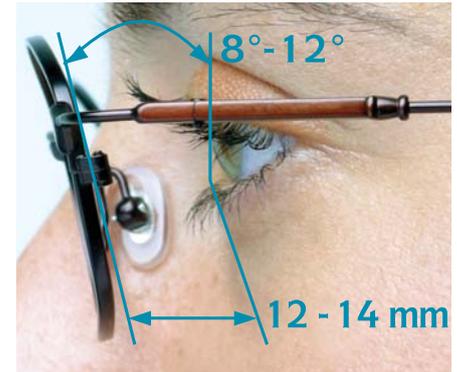
Adjust the frame to fit the face of the patient so that:

- The vertex distance is approximately 12 to 14 mm.
- The pantoscopic angle is in the range of 8° to 12°.

Proceed with the adjustments in this order:

- Adjustment of the front of the frame: face form, tilt, horizontality.
- Adjustment of the sides of the frame: opening, shape and length, ear pieces, closure of the sides.

Frame adjustment must always be completed before taking any height measurements.



4 TAKING THE MEASUREMENTS

Crucial to the success of lens fitting
Measuring then checking

2 Stages

STAGE 1

1 Taking the measurements

Measuring the pupillary distance

- Use the CRP (“Corneal Reflection Pupillometer”). Ensure that the nose pieces rest in the same position as the bridge of the final frame. Have the patient hold the pupillometer so that it is in contact with the forehead.



- Measure the monocular pupillary distances, right and left, for distance vision (infinity) and, for near vision (at 40 cm / 16 in.) if needed.

- Measure with both eyes open aligning the bar/line with the reflection on the pupils.
- If the wearer sees 2 images, measure one eye at a time, using the occluder find on the pupillometer.



4 TAKING THE MEASUREMENTS

Crucial to the success of lens fitting
Measuring then checking

Measurement of the pupillary heights

- Use the HMS (“Height Measuring System”) in order to obtain the Boxing measurements of pupillary heights for the right and left eyes.
- Adjust the frame on the face of the patient and set the HMS taking care not to modify the position of the frame.
- In a standing position, ask the client to naturally stand and look into the distance at eye level.



- Adjust the right and left cursors to the height of the pupil centers placing yourself at the same level as the eyes of the patient to avoid any parallax error (it can produce an error of several mm).

- Read the right and left pupillary heights in the Boxing system: make sure that the measurement is taken to the lower horizontal tangent to the lens (inside groove of rimmed frame).



For accuracy take the measurements with the patient standing up and looking into the distance.

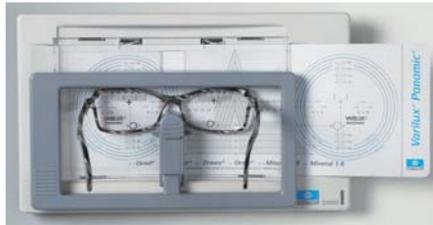
4 TAKING THE MEASUREMENTS

Crucial to the success of lens fitting
Measuring then checking

STAGE 2

2 Checking the measurements

- Using the Ditest or the centering chart mark the fitting cross position at monocular PD and height measurements, for each lens, as well as the position of the near vision circle. **Reposition the frame on the wearer's face.**



Checking distance centration

- In a standing position ask the patient to look into the distance, position yourself in front at eye level and check that the centering cross lies in front of the center of each pupil (see photo below).



Checking near vision (optional)

- Using the mirror VP System, check the correct positioning of the eyes in near vision : corneal reflections should coincide with the near vision circles.
- If there is an asymmetry take it into account by shifting each near vision PD by the required value while keeping the binocular PD measured at 40 cm / 16 in. with the pupillometer at 40 cm / 16 in. To obtain the distance centration add 2.5 mm to the near vision PDs found.



With the Ditest, select the diameter of the lenses needed or determine precisely the pre-calibration measurements (in the Boxing system) by measuring them on the frame. The order for Varilux lenses is now ready to be placed.



5 MOUNTING THE LENSES

Points to keep in mind

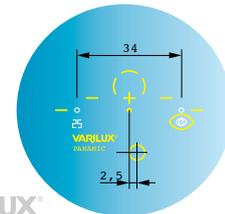
1 Check the conformity of the lenses and their markings

- **Verification of the distance prescription:** the measurement is carried out placing the **concave side** of the lens in contact with the support cone of the lensometer.
The control circle for distance vision must be centered on the aperture of the lensometer, the axis of the lens being horizontal.
- **Verification of the near prescription:** the measurement is carried out by placing the **convex side** of the lens in contact with the support cone of the lensometer.
The near vision circle must be centered on the aperture of the lensometer.



- **Verification of the addition:** it is the difference between the power for near vision and the power for distance vision measured on the front side. It is also possible to read its value directly thanks to 2 digits engraved under the temporal micro-circle.
- **Verification of markings** in order to check their correct position compared to the engravings (see diagram).

- **Prism verification** is carried out by placing the lensometer at the prism control point. The prism measured is the resultant of the thinning prism (the value of which is equal to $2/3$ of the addition) and of any prismatic correction prescribed.



VARILUX®

6 DELIVERING THE EYEGLASSES

The moment of truth

1 Adjust the frame to the patient's face

2 Check centering using markings

- In distance vision (general case): fitting cross in correspondance with pupil's center for the right and left eyes.
- In near vision (specific case of convergence asymmetry): in the patient reading position, corneal reflect should be seen through the near vision circle.

3 Finalize the frame adjustment

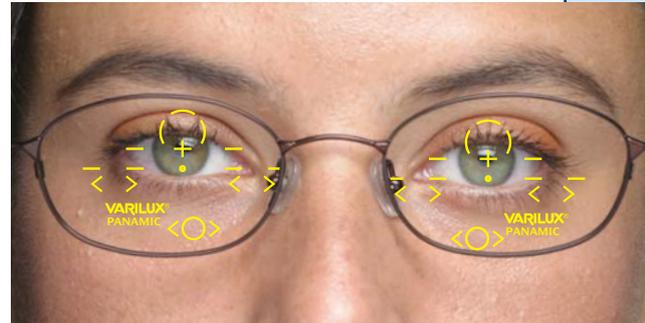
4 Check the vision quality

- In distance vision using a visual acuity test.
- In near vision using a reading test.

5 Give recommendations to assist adaptation

- Distance vision at eye level, looking straight ahead.
- Near vision in the lower part of the lens, by lowering the eyes (and slightly raising the head if necessary).
- To begin with all the movements of the head and eyes should be carried out slowly.

6 Inform the patient about the learning period necessary for each new pair of lenses



7 SOLVING ADAPTATION PROBLEMS

Follow a precise sequence in order to determine the problem

General steps

1 Record the precise complaints of the wearer

- Type of problem encountered, frequency and particular circumstances of problem, distances concerned, expedient solutions found, etc...

2 Measure the lenses

- Power of distance vision, near vision and addition.

3 Remark the lenses

- Centering cross for distance vision and near vision circles.

4 Check the correct centering of the lenses

- In distance vision and in near vision, frame positioned on the wearer's face.

5 Check the adjustment of the frame

- Vertical and horizontal alignment, pantoscopic tilt and stability.

6 Validate the patient's prescription

- Measure the acuity at distance and at near.
- Confirm the value of the addition as related to the age.

7 TROUBLESHOOTING GUIDELINES

This table relates to the complaints most often presented by wearers

WEARERS COMPLAINTS	CHARACTERISTICS EVENTUALLY BLAMED											POSSIBLE SOLUTIONS	
	Anti-reflection	Pupillary distance NV	Pupillary distance DV	Mounting height	Far vision	Addition	Adjustment	Distance lens/eye	Tilt of the frame	Former lenses	Astigmatism		
Has to raise head or lift lenses to read				●	●	●	●				●	<ul style="list-style-type: none"> ■ Modify the adjustment by lifting the frame ■ Increase the distance or near powers ■ Mount new lenses higher up 	
Needs to lower lenses or head to see better in distance vision				●	●	●	●				●	<ul style="list-style-type: none"> ■ Modify the adjustment by lowering the frame ■ Reduce the distance or near powers ■ Mount new lenses lower 	
Needs to tilt head to see clearly		●	●	●							●	●	<ul style="list-style-type: none"> ■ Modify the adjustment ■ Modify the centering ■ Check the astigmatism
Has a very reduced near vision field. Fatigue after prolonged work in near vision	●	●	●	●	●	●	●	●			●		<ul style="list-style-type: none"> ■ Reduce the addition ■ Reduce the addition and increase the distance power ■ Check the astigmatism ■ Modify the centering: mount lenses higher
Sees out of focus in lateral vision			●		●	●					●	●	<ul style="list-style-type: none"> ■ Verify the balance between right and left lenses ■ Reduce the distance power ■ Reduce the addition ■ Check the distance PDs and modify the centering ■ Check the pantoscopic tilt ■ Check the adjustment and the pantoscopic tilt

7 TROUBLESHOOTING GUIDELINES

This table relates to the complaints most often presented by wearers

WEARERS COMPLAINTS	CHARACTERISTICS EVENTUALLY BLAMED											POSSIBLE SOLUTIONS
	Anti-reflection	Pupillary distance NW	Pupillary distance DV	Mounting height	Far vision	Addition	Adjustment	Distance lens/eye	Tilt of the frame	Former lenses	Astigmatism	
Sees double at distance or near or both		●	●	●	●	●	●		●	●	●	<ul style="list-style-type: none"> ■ Check distance and near pupillary distances and heights to confirm centering ■ Check distance and near powers, astigmatism and balance between right and left eyes. ■ Check the adjustment and pantoscopic tilt ■ Compare with the previous glasses
Sees light sources doubled	●										●	<ul style="list-style-type: none"> ■ Make new lenses with an anti-reflective coating ■ Check the astigmatism
Sees lines deformed		●	●	●		●			●		●	<ul style="list-style-type: none"> ■ Check the astigmatism ■ Reduce the addition ■ Check the distance and near PDs and the heights to check centering ■ Modify the adjustment by lifting the frame or mount the new lenses higher
Has burning, itching sensation, feels ocular fatigue	●	●		●	●	●				●	●	<ul style="list-style-type: none"> ■ Check the distance and near PDs and the heights to check centering ■ Check distance and near powers, astigmatism and balance between right and left eyes ■ Compare with the previous glasses ■ Make new lenses with an anti-reflective coating

**For further information
or for downloading this Varilux Fitting Guide
visit our web site at:**

www.varilux-university.org

VARILUX®
UNIVERSITY



Optics keeps progressing. So will you.

www.varilux-university.org

