

VARILUX[®] FITTING GUIDE



A GUIDE TO THE SUCCESSFUL
FITTING OF VARILUX[®] LENSES



WELCOME

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

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

A genuine **working tool**, this guide will be found useful in your daily routine and will help you to be successful in fitting progressive lenses and help **to guarantee patient satisfaction**.

Please use it regularly!

FITTING VARILUX STEP BY STEP

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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, colour, 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 spectacles used for?

- Permanent or occasional wear?
- 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 correction 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 with prescriber and ensure its acceptance.

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 are rarely ever necessary.

CHECKING WHETHER THE ADDITION IS TOO STRONG

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

1 Checking near vision correction

Using the Essilor "CheckTest"

The subject 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 either correct or too weak. If they are seen more clearly on the red background, the near vision correction is probably too strong.



- With the Helmholtz test pattern

If the circles in the centre 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 either correct or too weak.

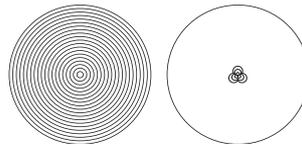


Image of pattern's centre



With an additional power of -1.00 D

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

The CheckTest is available for free from Varilux University. Don't hesitate to ask for it while visiting our web site at: www.varilux-university.org



CHECKING WHETHER THE ADDITION IS TOO STRONG

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

2 Detecting under-corrected hypermetropia

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 subject 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.

NB. Any prescription changes must be undertaken by a registered prescriber.



With an additional power of + 0.50 D

Place the + 0.50 D lenses in front of the distance vision correction of the subject and ask the subject 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 subject'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 subject looking at medium size letters, rapidly twirl the cross cylinder and ask the subject 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 subject cannot (or can hardly) tell 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 subject looking at a line of small letters, rapidly twirl the cross cylinder and ask the subject which position of the cross cylinder is preferred.
- If the subject 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 subject cannot (or can hardly) tell the difference.
- Record the minimum value of the cylinder power found.

c) Check the sphere power

- Add +0.25 D to the sphere for each -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 dissociating the eyes and checking the visual acuity.

1) Dissociate the subject'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 hypermetropia, but do not overplus.
- Do not over-correct, rather prefer a slight under-correction. 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 binocular 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 really necessary.

DETERMINATION OF THE ADDITION

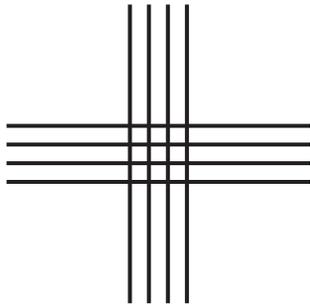
THE "FIXED CROSS CYLINDER" METHOD

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 subject to fixate a cross made up of vertical and horizontal lines at a distance of 40cm (16 in).
- Position ± 0.50 D cross cylinders with their minus axes at 90° before both eyes: the subject 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 subject to confirm that vision is comfortable when reading.
- Adjust the value of the addition for the subject'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 subject 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 subject to read.
- If can read the smallest text, add -0.25 D, -0.50 D etc..., binocularly, until reading is no longer possible.
- If cannot read the smallest text put up +0.25 D, +0.50 D etc. . . , binocularly, until the smallest text can just be read.

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

2 Determination of the addition

Normally, subjects 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 = $1 / \text{near distance} - 2 / 3 \text{ total amplitude}$.

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 subject can read comfortably

- Put up the distance correction with the proposed near addition in a trial frame.
- Ask the subject to confirm that vision is comfortable when reading.
- Adjust the value of the addition for the subject'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 only when it provides a real gain in visual acuity.

2 Determining the minimum addition at 40 cm (16 in)

Add binocularly + 0.25 D, + 0.50 D, etc... to the distance correction until the patient just 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 subject 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 it occurs 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

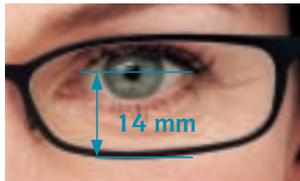
1 Selecting the frame

Select a frame which is right for the wearer's face, that is stable on the nose and offers sufficient height between the pupil and the lower rim of the frame.

17 mm minimum for Varilux Physio.
18 mm minimum for Varilux Panamic and Varilux Comfort.



18, 16 or 14 mm for Varilux Ipseo.
14 mm minimum for Varilux Ellipse.



2 Adjusting the frame

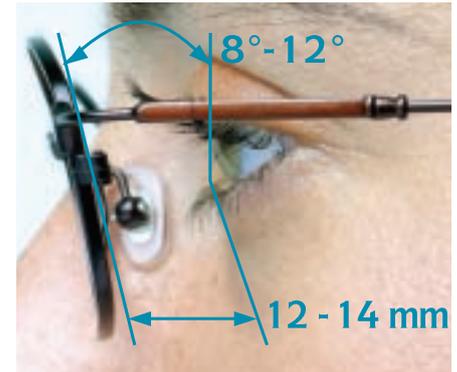
Adjust the frame to fit the face of the client so that:

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

Proceed with the adjustments in the order:

- Adjustment of the front of the frame: projection, inclination, horizontality.
- Adjustment of the sides of the frame: opening, shape and length, ear pieces, closure of the sides.

The frame should always be adjusted before starting to take measurements.



4 TAKING THE MEASUREMENTS

A crucial step for the success of lens fitting
Measure then check

2 Stages

1 Taking the measurements

Measuring the pupillary distance

- Use the CRP (“Corneal Reflection Pupillometer”) ensuring that the nose pieces have been adjusted so that they rest in the same position as the bridge of the final frame and checking that it is in contact with the forehead.



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

- Measure each eye separately with both eyes open.
- If the wearer sees 2 images, measure one eye at a time, using the eye mask of the pupillometer.



4 TAKING THE MEASUREMENTS

A crucial step for the success of lens fitting
Measure then check

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.
- Preferably in a standing position, ask the client to adopt a natural position and to look into the distance at eye level.



- Adjust the right and left cursors to the height of the pupil centres 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 subject standing up and looking into the distance.

4 TAKING THE MEASUREMENTS

A crucial step for the success of lens fitting
Measure then check

2 Checking the measurements

- Using the Ditest or the centring 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 centring cross lies in front of the centre of each pupil (see photo below).

Checking in near vision (optional)

- Using the VP System, check using the mirror method the correct positioning of the eyes in near vision: corneal reflections should coincide with the near vision circles.
- If there is a manifest 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

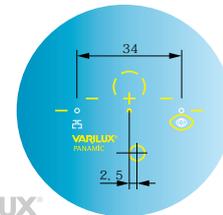
1 Check the conformity of the lenses and of their markings

- **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 focimeter. The control circle for distance vision must be centred on the aperture of the focimeter, 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 focimeter. The near vision circle must be centred on the aperture of the focimeter.



- **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 from the 2 digits engraved under the temporal micro-circle.
- **Verification of markings** in order to check their correct position compared with the engravings (see scheme herein).

- Prism verification is carried out by placing the focimeter 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.



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5 MOUNTING THE LENSES

Points to keep in mind

2 Make sure that both centring and mounting are made in the Boxing system

- All values must be given in the Boxing system.
- Centring and edging equipment must function in this system.

3 Check the conformity of the mounting

Using the Ditest device or the centring chart, check:

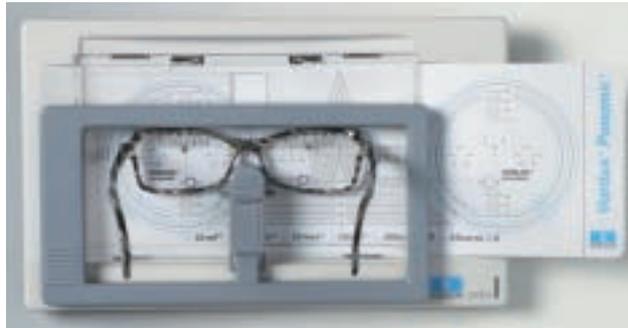
- the right and left PDs,
- the right and left heights,
- the horizontality of the mounting:
by the alignment of the micro-circles.

4 Make sure the frame is correctly set up

Pre-adjust the frame paying particular attention:

- to the positioning of the lenses in the same plane,
- to the pantoscopic angle.

5 Retain the lens markings until delivery (or retrace them if they have disappeared)



6 FINAL FITTING

The moment of truth

1 Adjust the frame to the patient's face

2 Check centring using markings

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

3 Finalise the frame adjustment

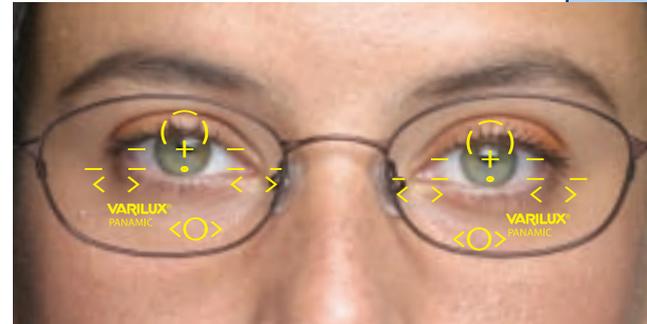
4 Check the vision quality

- 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, all head and eye movement should be carried out slowly.

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



7 SOLVING ADAPTATION PROBLEMS

It is necessary to follow a precise sequence in order to determine the problem
Thorough research must be conducted

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

- Fitting cross for distance vision and near vision circles.

4 Check the correct centration 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 subject's prescription

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

7 A TABLE OF CAUSES TO EXPLORE

This table relates to the complaints most often presented by wearers with characteristics which were eventually blamed.

WEARERS COMPLAINTS	CHARACTERISTICS EVENTUALLY BLAMED										POSSIBLE SOLUTIONS		
	Anti-reflection	Pupillary distance NV	Pupillary distance DV	Mounting height	Far vision	Addition	Adjustment	Distance lens/eye	Inclination 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 centring ■ 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 distance and increase the distance power ■ Check the astigmatism ■ Modify the centring: 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 centring ■ Check the pantoscopic angle ■ Check the adjustment and the pantoscopic angle

7 A TABLE OF CAUSES TO EXPLORE

This table relates to the complaints most often presented by wearers with characteristics which were eventually blamed.

WEARERS COMPLAINTS	CHARACTERISTICS EVENTUALLY BLAMED										POSSIBLE SOLUTIONS	
	Anti-reflection	Pupillary distance IW	Pupillary distance DV	Mounting height	Far vision	Addition	Adjustment	Distance lens/eye	Inclination 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 centring ■ Check distance and near powers, astigmatism and balance between right and left eyes. ■ Check the adjustment and pantoscopic angle ■ Compare with the previous spectacles
Sees light sources doubled	●										●	<ul style="list-style-type: none"> ■ Make new lenses with an anti-reflective coating ■ Verify 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 centring ■ 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 centring ■ Check distance and near powers, astigmatism and balance between right and left eyes ■ Compare with the previous spectacles ■ 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





Optics keeps progressing. So will you.

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