ESSENTIAL RULES FOR THE SUCCESSFUL FITTING OF PROGRESSIVE LENSES TO YOUR PRESBYOPIA PATIENTS
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 **working tool**, this guide will be useful for your daily routine and will help you to be successful in fitting progressive lenses and help to guarantee **patient satisfaction**.

**Please use it for all patients!**
FITTING PROGRESSIVE LENSES
STEP BY STEP

1. UNDERSTANDING THE PATIENT
2. ANALYSING THE PRESCRIPTION
3. SELECTING THE FRAME
4. TAKING THE MEASUREMENTS
5. EDGING/MOUNTING THE LENSES
6. DELIVERY AND FINAL FITTING
7. MONITORING OF THE ADAPTATION
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...

**ANALYSING 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 required.
- Field of vision needed.
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 with the 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.

<table>
<thead>
<tr>
<th>AGE</th>
<th>ADDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 years</td>
<td>1.00 D</td>
</tr>
<tr>
<td>47 years</td>
<td>1.25 D</td>
</tr>
<tr>
<td>49 years</td>
<td>1.50 D</td>
</tr>
<tr>
<td>51 years</td>
<td>1.75 D</td>
</tr>
<tr>
<td>54 years</td>
<td>2.00 D</td>
</tr>
<tr>
<td>58 years</td>
<td>2.25 D</td>
</tr>
<tr>
<td>63 years</td>
<td>2.50 D</td>
</tr>
<tr>
<td>67 years</td>
<td>2.75 D*</td>
</tr>
<tr>
<td>70 years</td>
<td>3.00 D*</td>
</tr>
<tr>
<td>75 years</td>
<td>3.25 D*</td>
</tr>
<tr>
<td>80 years</td>
<td>3.50 D*</td>
</tr>
</tbody>
</table>

* Additions over +2.50 D are rarely ever necessary, except in case of short reading distance and/or poor visual acuity.
In distance vision

DETECTING UNDER-CORRECTED HYPERMETROPIA

This is often the cause of a too strong 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 hypermetropia is probably under-corrected.

→ 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 hypermetropia is probably undercorrected.
2 In near vision

USING THE ESSILOR CHECKTEST™

The subject wearing the near vision correction, position the CheckTest at their 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 possibly 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 too strong or too weak.

→ 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 from Essilor Academy. Do not hesitate to ask for it when visiting our web site at www.essiloracademy.eu
Everything takes place at the dispensing desk, using a few quick tests and very simple equipment.

1 | Distance Vision (DV)

Placing the DV prescription lens in the trial frame.
- Have the patient look into the distance or at an eye chart in the practice. Assess visual acuity, first with both eyes open and then each eye in turn (occlusion).
- Confirm the prescription with a binocular lorgnette of +0.50 D then -0.50 D:
  - +0.50 D should fog the subject’s vision
  - -0.50 D should have no significant effect (possibly repeat with front +0.25 D and -0.25 D).
- Compare the vision of the two eyes, by occluding each eye in turn:
  - Vision should be balanced or slightly favour the dominant eye (determined using the CheckTest)
- To confirm the RE/LE balance: place +0.50 D in front of both eyes and compare the RE/LE blurring:
  - If vision is balanced, use that prescription.
  - If vision is not balanced, add +0.25 D in front of the eye that sees best until balance is achieved.
  - If it is not possible to achieve balance, allow the dominant eye to remain dominant.
- If corrected visual acuity remains poor, understand the reasons why or check the astigmatism using cross cylinder method (see page 11).

2 | Near Vision (NV)

Place the NV prescription lens in the trial frame.
- Ensure that the patient can see comfortably at a normal reading distance.
- Confirm clear vision range in relation to his/her visual habits and needs.

WITH CHECKTEST™
- Compare letters on a red background and on a green background:
  - Vision should be balanced or slightly clearer on a green background.
  - A preference for the red background indicates that the prescription is too strong.

USING A PROXIMETER®
- Confirm the addition with a reading test.
- Confirm the RE/LE balance in near vision (by positioning the septum):
  - Vision should be balanced.
  - If not, add +0.25 D to the eye that sees less clearly.

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

**1 | Determination of the sphere**

**USING THE FOGGING METHOD**
- Place the trial prescription in front of the subject’s eye and measure the visual acuity.
- Fog the eye by adding +1.00 D or +1.50 D to cause a drop in visual acuity.
- Unfog progressively by -0.25 D steps and check that the visual acuity improves.
- Continue until the best acuity is obtained.
- Record the power of the strongest plus sphere that provides maximum visual acuity.

**USING THE CROSS CYLINDER METHOD**
→ **Verify the cylinder axis** (with cross cylinder ± 0.50 D):
  - 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 or a target of points, 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.

→ **Verify the cylinder power** (with cross cylinder ± 0.25 D):
  - 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 or a target of points, 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.

→ **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.

For a more detailed information on refraction techniques, refer to the Ophthalmic Optics File “Practical Refraction” of Essilor Academy available on www.essiloracademy.eu

SUPPLEMENT

**REFRACTION IN DISTANCE VISION (1)**

AN ACCURATE DISTANCE PRESCRIPTION RESULTS IN THE MOST COMFORTABLE NEAR PRESCRIPTION
REFRACTION IN DISTANCE VISION (2)
AN ACCURATE DISTANCE PRESCRIPTION RESULTS IN THE MOST COMFORTABLE NEAR PRESCRIPTION

3 Binocular balance

➔ Dissociate the subject’s eyes
  ■ by alternate occlusion: rapidly occlude one eye, then the other, with an occluder or
  ■ with vertical prism: introduce $3 \Delta$ base down before one eye and $3 \Delta$ base up before the other or
  ■ by polarization: use polarized tests for visual acuity together with the corresponding polarized filters.

➔ Fog both eyes
  with $+0.50$ D spheres and confirm that there is a drop in acuity

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

➔ Unfog binocularly the eyes in -$0.25$ D steps until the maximum acuity is obtained.

➔ 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 hypermetropia, “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 $10^\circ$ on the axis, unless it is really necessary.

For a more detailed information on refraction techniques, refer to the Ophthalmic Optics File “Practical Refraction” of Essilor Academy available on www.essiloracademy.eu
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:

\[
\text{Addition} = \frac{1}{\text{near distance}} - \frac{2}{3} \times \text{total amplitude}.
\]

For example:

closest reading distance = 0.50 m,
amp. of accommodation = 2.00 D.

**Determination of the Near Addition**

1. **Measure the amplitude of accommodation**
   
   In 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 add +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:

   \[
   \text{Addition} = \frac{1}{\text{near distance}} - \frac{2}{3} \times \text{total amplitude}.
   \]

<table>
<thead>
<tr>
<th>Total amplitude of accommodation</th>
<th>Usable amplitude of accommodation (≤ 2/3 acc. max.)</th>
<th>Addition for 40 cm (16 in) (= 2.50 D – 2/3 acc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00</td>
<td>2.00</td>
<td>0.50</td>
</tr>
<tr>
<td>2.75</td>
<td>1.75</td>
<td>0.75</td>
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<tr>
<td>2.50</td>
<td>1.50</td>
<td>1.00</td>
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<td>2.25</td>
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<td>1.25</td>
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<tr>
<td>1.00</td>
<td>0.50</td>
<td>2.00</td>
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<tr>
<td>0.75</td>
<td>0.50</td>
<td>2.00</td>
</tr>
<tr>
<td>0.50</td>
<td>0.25</td>
<td>2.25</td>
</tr>
</tbody>
</table>

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.

For a more detailed information on refraction techniques, refer to the Ophthalmic Optics File “Practical Refraction” of Essilor Academy available on www.essiloracademy.eu
DETERMINATION OF THE NEAR ADDITION (2)
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 hypermetropia (see pages 11 and 12).

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 (+ 0.75 D for low additions, + 1.00 D for high additions).

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.

For a more detailed information on refraction techniques, refer to the Ophthalmic Optics File “Practical Refraction” of Essilor Academy available on www.essiloracademy.eu
1 | Fully correct distance vision

Use the highest plus sphere which provides maximum visual acuity (see pages 11 and 12).

2 | Determine the addition value

- Ask the subject 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° in front of both eyes: the subject should report that the horizontal lines are clearer.
- Progressively, place +0.25, +0.50, +0.75 D… lenses in front of 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.

For a more detailed information on refraction techniques, refer to the Ophthalmic Optics File “Practical Refraction” of Essilor Academy available on www.essiloracademy.eu
1 Frame selection

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.

For optimal visual comfort, minimum distance of:
- 17 mm between pupil center and bottom of the frame for regular progressive lenses and 14 mm for short corridor progressive lenses
- 10 mm between pupil center and top of the frame.

2 Frame adjustment

Adjust the frame to fit the face of the patient so that, in average:
- 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 any measurements.

After adjustment, if the frame parameters are significantly different from average values, the choice of a progressive lens with personalised fitting parameters is recommended for wearer’s optimal vision.
Before you take any measurements, it is essential that the frame be adjusted to the patient’s face.

1 With an electronic measuring column

PREREQUISITE

- Adjust the frame: reproduce subsequent wearing conditions.
- Ensure that the frame is horizontal and that the lens planes are symmetrical.
- Check the position of the frame: right and left sides in the same plane.
- If possible, remove the presentation lenses. Do not take measurements using corrective lenses.
- Adjust the measuring distance and the height of the camera.
- Note how the patient holds the head during the preparation phase.

POSITIONING THE CLIP

- Centre the clip on the bridge of the frame.
- Press the clip’s rear hooks against the frame: the hooks plane parallel to the lens plane.
- Allow the patient to position the frame on his/her face.
- Check that the clip is still correctly positioned.

VIDEO CAPTURE

- Ensure that the patient adopts a natural posture; do this by getting them to look right, then left then straight ahead.
- Check how the head is held in real time and how the natural posture is kept.
- Record the average value of the head cape angle.
- Take the video in two stages:
  - static front view
  - dynamic rotational three-quarters view.
- Check that the sensors have been read correctly.
  - Select the front view corresponding to the determined cape angle.
  - Select the three-quarters view, with an angle of between 15° and 25°.

NB: Measurement procedure based on the use of the Essilor Visioffice system.
PRODUCING THE BOXING FRAME

Setting boxing tangents is fundamental to the accuracy of the measurement:

- Check the positioning of the corneal reflexes (cross on reflection) and adjust them if necessary.
- Rimmed frame: align the right horizontal and vertical markers tangentially with the lens/frame boundary (at the inner edge of the frame, do not take the groove into consideration).
- Nylor or rimless frame: position the straight markers on the front edge of the lens.
- Finish by choosing the type of frame.

RESULTS SCREEN

ADDITIONAL MEASUREMENTS

→ Reading distance
- Place the reading chart in the board coupled to the system.
- Ask the patient to hold the board like a book in his/her natural reading posture.
- Or re-position the clip on the old corrective spectacles and ask the patient to read (reading the largest letters in the reading chart allows any under-correction of near vision of about 0.50 D to be taken into account).

Check the correspondence between the reading distance and the addition value: the reading distance (in metres) should not be greater than the reciprocal of the addition (in dioptres).

Example: if add = 2.50 D, reading distance ≤ 0.40 m.

→ Dominant eye
- Invite the patient to step back from the column (1.30 m) and hold the board with arms outstretched.
- Ask the patient to fixate the target sticker on the base of the column through the hole in the board.

NB: Measurement procedure based on the use of the Essilor Visioffice system.
**SUPPLEMENT**

**CAPE ANGLE**
- Default selection: image showing the head cape closest to 0°.
- If a cape angle is observed, confirm the patient’s head posture is natural and the frame is properly adjusted.
- If the cape angle is confirmed, the corresponding image should be selected.
- If the cape angle varies, take two measurements and proceed as follows:

<table>
<thead>
<tr>
<th>Two measurements: Cape 1 and Cape 2</th>
<th>Average value (AV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comparing the two measurements</strong></td>
<td></td>
</tr>
<tr>
<td>Situation 1</td>
<td>Cape 1 - Cape 2 &gt; ±2° Unstable AV</td>
</tr>
<tr>
<td>Situation 2</td>
<td>Cape 1 - Cape 2 ≤ ±2° AV = (Cape 1 + Cape 2)/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurements: front view</th>
<th>Take the image closest to 0° strictly &lt; ±5°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visioffice results page</td>
<td></td>
</tr>
</tbody>
</table>

**POINTS TO WATCH**

<table>
<thead>
<tr>
<th>AVERAGE VALUE</th>
<th>POINTS TO WATCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANTOSCOPIC TILT</td>
<td>Between 8° and 12°</td>
</tr>
<tr>
<td>WRAP ANGLE</td>
<td>Between 6° and 8°</td>
</tr>
<tr>
<td>EYE ROTATION CENTER (ERC) DISTANCE</td>
<td>Between 16 mm and 36 mm</td>
</tr>
<tr>
<td>MONOCULAR PUPILLARY DISTANCES</td>
<td>Monocular pupillary distances depend on the cape angle.</td>
</tr>
<tr>
<td></td>
<td>If the monocular distances are inconsistent, check that the crosses are matching the corneal reflexes.</td>
</tr>
<tr>
<td>FITTING HEIGHT</td>
<td>Minimum values:</td>
</tr>
<tr>
<td></td>
<td>Short progressive designs =14 mm</td>
</tr>
<tr>
<td></td>
<td>Other designs =17 mm</td>
</tr>
<tr>
<td>READING DISTANCE</td>
<td>Between 28 cm and 50 cm</td>
</tr>
<tr>
<td>DOMINANT EYE</td>
<td>-</td>
</tr>
<tr>
<td>HEAD-EYE COEFFICIENT</td>
<td>No average value</td>
</tr>
</tbody>
</table>

**NB**: Measurement procedure based on the use of the Essilor Visioffice system.
**PREREQUISITE AND POSITIONING OF THE CLIP**
- Proceed as shown on page 19.

**FIRST PHOTOGRAPH**
- Position the apparatus approximately 60-90 cm from the patient with his/her eyes approximately 20 cm above it.
- Ask the patient to sit in a comfortable upright position with a straight back and both feet on the floor.
- Ask the patient to turn his head left and right and then to look straight ahead at distance.
- Take the picture when the screen changes to green (correct head position).

**SECOND PHOTOGRAPH**
- Ask the patient to lower the head by at least 10° and fixate the bright dot.
- Take the picture when the screen changes to green (correct head position).

**READING DISTANCE**
- Ask the customer to hold the board like a book in his/her natural reading posture.
- Or re-position the clip on the old corrective spectacles and ask the patient to read the text (reading the largest letters in the test allows any under-correction of near vision to be taken into account).
- Take a picture and follow instructions on screen to calculate the reading distance.

**PRODUCING THE BOXING FRAME**
- On the first photograph, check the red dotted ring over each iris is centered properly. If not, position it manually.
- Proceed as shown on page 20 to adjust boxing lines.
- The boxing tangent positioning is crucial for accuracy of the measurement.

**RESULTS SCREEN**
- 

**NB:** Measurement procedure based on the use of the Essilor M’eye Fit System
4 TAKING THE MEASUREMENTS
A CRUCIAL MOMENT FOR THE SUCCESS OF THE PAR SPECTACLES

Before you take any measurements, it is essential that the frame be adjusted to the patient’s face.

3 With traditional instruments

MEASURING THE MONOCULAR PUPILLARY DISTANCES

Using a Corneal Reflection Pupillometer (CRP).

→ Position the pupillometer
  - Take the measurement, preferably with the patient in a standing position.
  - Set the pupillometer measuring distance (at infinity and then at 0.40 m).
  - Lift up the forehead rest and position the pupillometer on the customer’s nose (for example, suggesting that they “hold it like a pair of binoculars”).
  - Ensure that the pupillometer is positioned as the frame will be.
  - Release the forehead rest. Check that the pupillometer is horizontal and in contact with the patient’s forehead.

→ Take the measurement for distance vision (at infinity) and, for near vision (at 40 cm).
  - Move the right and left reticles to bring them into line with the corneal reflexes.
  - Take the measurement with both eyes open and then each eye in turn, using the pupillometer’s eye occluder.
  - If there is a deviating eye and/or split perception, take the measurement one eye at a time using the eye occluder.

→ Note the pupillary distances
  - Read the right and left monocular pupillary distances.
  - Note whether there is a lack of symmetry between the right and left distances and confirm. (If there is any doubt, take the measurement again, checking that the pupillometer is correctly positioned on the patient’s nose).
  - Note the binocular pupillary distance, the sum of the two monocular distances.

To ensure optimum comfort, use tools that guarantee a measurement accuracy of at least ± 0.5 mm on the heights and monocular pupillary distances, taking any asymmetry into consideration.
MEASURING PUPILLARY HEIGHTS

Using the Height Measuring System (HMS).

Position the tool on the customer’s frame
- Position the frame on the patient’s face and ensure that it is properly adjusted.
- Take the instrument between your thumbs and index fingers and hold the movable clips open.
- Position the instrument on the frame using the upper clips and release the clips on the bottom of the frame. Centre the instrument on the bridge of the frame.
- Check that the position of the frame on the patient’s face has not changed.

Take the measurement for distance vision, in a standing position
- Get the customer to adopt a natural position and look into the distance at eye height. (To do this, get them to look right, then left, then straight ahead).
- Position the white line on each cursor over the centre of the pupil, using the knurled knobs on the sides. Stand facing the customer, and at same height to avoid any parallax error. If the centre of the pupil is difficult to see, create a corneal reflex using a pen-torch.
- Read the tangent graduation at the bottom of the frame before removing it and note the pupillary height, taking the depth of the lens groove into consideration.
- Note whether there is a difference between the right and left heights and confirm. (If there is any doubt, take the measurement again, checking that the frame is correctly adjusted horizontally).

Pupillary height = distance separating the centre of the pupil from the tangent at the bottom of the frame (at the base of the groove).

To ensure optimum comfort, use tools that guarantee a measurement accuracy of at least ± 0.5 mm on the heights and monocular pupillary distances, taking any asymmetry into consideration.
TAKING ADDITIONAL MEASUREMENTS for personalised progressive lenses
Using the measurement tool (Fit System®).

This tool allows to determine the lens personalisation parameters: vertex distance, pantoscopic tilt and wrap angle. These parameters allow the lens design calculation to be optimised according to the lens’s exact position in front of the patient’s eye.

→ Vertex distance

Vertex distance = the distance between the rear surface of the lens and the apex of the patient’s cornea.

Measuring the vertex distance:
- Position the frame on the patient’s face in the adopted position and ensure that it is properly adjusted.
- Get the patient to look into the distance.
- Position the tool on the side of the frame, parallel to the arm.
- Bring the extremity of the tool at the level of the apex of the cornea.
- Note the distance separating the apex of the cornea from the plane of the lenses.
Before you take any measurements, it is essential that the frame be adjusted to the patient’s face.

**Pantoscopic tilt**

- Pantoscopic tilt = the angle between the lens plane and the vertical plane.

It corresponds to the tilt of the frame in relation to the primary horizontal direction of gaze.

Measuring the pantoscopic tilt:
- Remove the display lenses (except for rimless or nylor frames).
- Position the frame on the patient’s face and ensure that it is perfectly adjusted.
- Get the patient to look into the distance, in a natural position.
- Apply the lateral face of the tool against the edges of the frame.
- Read the pantoscopic angle shown by the bubble level.

**Wrap angle (or face form angle)**

- Wrap angle = the angle formed by the plane passing though the edges of the right or left calibre of the frame – at its two extremities – and the plane tangent to the frame’s bridge in its middle.

Measuring the wrap angle:
- Place the tool flat (on a table).
- Position the frame on the tool, symmetrically in relation to the graduations, with the arms exactly horizontal.
- Read the angle indicated by the graduation aligned with the temporal edges of the frame (must be identical right and left).
Reading distance

This distance allows the lateral positioning of the lens’s near vision zone to be optimised (the shorter the reading distance, the greater the inset).

Measuring the reading distance:

- The patient should wear his/her near vision correction (either on a trial frame or by using the previous spectacles).
- Give the patient a reading text and ask him/her to read medium-sized characters.
- Ensure that the patient adopts a natural reading position.
- Using a tape measure or other suitable device, measure the distance between the reading chart and the lens plane.

The reading distance (in metres) cannot be greater than the reciprocal of the addition (in dioptres).
Using a Ditest or centring chart, mark the distance vision centring crosses on the pupillary distances and heights measured and mark the positioning of the near vision circles. Allow the customer to re-position the frame on his/her face.

**CHECKING IN DISTANCE VISION**

- Have the customer look into the distance, position yourself facing him/her at eyes height and check that the centring crosses coincide with the centres of the pupils (see photograph to right).
- The RE and LE pupillary heights are usually similar. If a difference in height is observed:
  - check the adjustment of the frame, especially any horizontal misalignment, often a cause of difference in height.
  - check that the subject’s face is indeed vertically asymmetrical.
If a difference in height is confirmed, reproduce it in the glazing.

All our designs are calculated for full pupil centring. Meeting this centring condition is essential for achieving optimum vision comfort.
1. Check the conformity of the lenses and their markings

- Checking distance vision power: measurement is made by placing the concave face of the lens in contact with the bearing cone of the focimeter. The distance vision control circle must coincide with the bearing cone of the focimeter, the axis of the lens being horizontal.

- The designs of some lenses take complex optimisation criteria into account (aspherisation, customisation, etc.) affecting the direct reading on the focimeter. These lenses are supplied with double labelling.

- The complexity of some progressive designs and their various optimisation parameters make the location and control of near vision power on the focimeter difficult. Make a simple and reliable check by reading the temporal engraving of the addition value.

- Checking the correct positioning of markings in relation to the engravings.

- Verification of the prism: this is done by placing the focimeter on the prism control point (middle of the 2 micro-circles). The prism measured is the resultant of the thinning prism (2/3 of the addition) and a corrective prism if any.
5 EDGING/MOUNTING THE LENSES
A FEW STEPS TO FOLLOW

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 work 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 (or retrace) the lens markings until delivery

For the final fitting and checking on the patient’s face.
1 Adjust the frame to the patient’s face
- Respect the frame position chosen by the patient.

2 Check centring using markings
- In distance vision: fitting cross in correspondence with pupil centre for the right and left eyes.

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

DELIVERY AND FINAL FITTING
THE MOMENT OF TRUTH
1 | Visual comfort

- Perfect adjustment is essential to obtain the greatest benefit from a progressive lens design.
- Encourage your patients to visit you regularly to have their spectacles checked and adjusted.

2 | Visual transparency

- Recommend that the lenses always be wiped with a microfibre cloth and, if they are very dirty, washed in lukewarm water and liquid soap or a suitable product that does not contain any harsh chemicals.
- Recommend that spectacles be stored in a case after use, that they never be put lenses face down and that they never be exposed to a heat source (car windscreen, etc.)

3 | Visual efficiency

- Explain to your patients how presbyopia develops over time.
- Advise them to have their eyes checked regularly, so that they are always wearing a correction suitable for their needs, thus making it easier to adapt to a change of prescription.
4 Certificate of authenticity

- Essilor lenses are supplied with a certificate of authenticity guaranteeing their origin and identifying the types of lens worn and the exact prescriptions.
- Tell the patients how important it is to keep this certificate and present it every time they visit their Eye Care Professionals.

5 Guaranteed adaptation

- State that Varilux and Essilor progressive lenses carry the Essilor guarantee of adaptation within a one month period.
- Under this offer, the customer has one month from the date of delivery to express any persistent difficulty in adapting, despite wearing the spectacles regularly. If the cause of the difficulty requires that the spectacles be modified, replace the lenses, giving consideration to the analysis of the reasons for the failure to adapt. For this, comply with the conditions in the Essilor Progressive Lenses adaptation guarantee described in the general conditions of sale.
SUPPLEMENT

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 crosses 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 visual acuity at distance and the reading ability at near.
- Confirm the value of the addition as related to the age.

SOLVING ADAPTATION PROBLEMS
IT IS NECESSARY TO FOLLOW A PRECISE SEQUENCE IN ORDER TO DETERMINE THE PROBLEM. THOROUGH RESEARCH MUST BE CONDUCTED.
### WEARERS COMPLAINTS

<table>
<thead>
<tr>
<th>WEARERS COMPLAINTS</th>
<th>POSSIBLE SOLUTIONS</th>
</tr>
</thead>
</table>
| Has to raise the head or lift lenses to read                                      | 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                     | Modify the adjustment by lowering the frame  
Reduce the distance or near powers  
Mount new lenses lower |
| Needs to tilt head to see clearly                                                  | Modify the adjustment  
Modify the centring  
Check the astigmatism |
| Has a very reduced near vision field. Fatigue after prolonged work in near vision  | Check the addition  
Reduce the addition and increase the distance power  
Check the astigmatism  
Modify the adjustment by lifting the frame  
Modify the centring: mount lenses higher |
| Sees out of focus in lateral vision                                                | 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 |

### CHARACTERISTICS EVENTUALLY BLAMED

<table>
<thead>
<tr>
<th>WEARERS COMPLAINTS</th>
<th>POSSIBLE SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-reflection</td>
<td></td>
</tr>
<tr>
<td>Pupillary distance NV</td>
<td></td>
</tr>
<tr>
<td>Pupillary distance DV</td>
<td></td>
</tr>
<tr>
<td>Mounting height</td>
<td></td>
</tr>
<tr>
<td>Distance vision</td>
<td></td>
</tr>
<tr>
<td>Addition</td>
<td></td>
</tr>
<tr>
<td>Distance lens/eye</td>
<td></td>
</tr>
<tr>
<td>Indication of the frame</td>
<td></td>
</tr>
<tr>
<td>Former lenses</td>
<td></td>
</tr>
<tr>
<td>Astigmatism</td>
<td></td>
</tr>
</tbody>
</table>

This table relates to the complaints sometimes presented by wearers with characteristics which were eventually blamed.
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<tr>
<td>Sees double at distance or near or both</td>
<td>■ Check distance and near pupillary distances and heights to confirm centring</td>
</tr>
<tr>
<td></td>
<td>■ Check distance and near powers, astigmatism and balance between right and left eyes</td>
</tr>
<tr>
<td></td>
<td>■ Check the adjustment and pantoscopic angle</td>
</tr>
<tr>
<td></td>
<td>■ Compare with the previous spectacles</td>
</tr>
<tr>
<td>Sees light sources doubled</td>
<td>■ Make new lenses with an anti-reflective coating</td>
</tr>
<tr>
<td></td>
<td>■ Verify the astigmatism</td>
</tr>
<tr>
<td>Sees lines deformed</td>
<td>■ Check the astigmatism</td>
</tr>
<tr>
<td></td>
<td>■ Reduce the addition</td>
</tr>
<tr>
<td></td>
<td>■ Check the distance and near PDs and the heights to check centring</td>
</tr>
<tr>
<td></td>
<td>■ Modify the adjustment by lifting the frame or mount the new lenses higher</td>
</tr>
<tr>
<td>Has burning, itching sensation, feels ocular fatigue</td>
<td>■ Check the distance and near PDs and the heights to check centring</td>
</tr>
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<td>■ Check distance and near powers, astigmatism and balance between right and left eyes</td>
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or for downloading or ordering this
Progressive Lenses Fitting Guide,
visit our website at:

www.essiloracademy.eu