Advanced Dispensing for Paraoptometric Assistants

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Working with Rimless

Lab Work For Rimless Eyewear Drilling

• Finishing the hole
Protecting the lens

- Rimless frames often have exotic lenses
- Lens tapes are a good bet
- Clean hands
- Clean bench

Mounting techniques

- Be sure strap is bent properly
- Proper hardware sequence
- First protect the lens (Top Hat Washers)
- Then protect the protectors (Metal Washers)
- Locknuts or Loc-tite
- Finishing the nut or cap nut
Mounting

• Barrel Type

Mounting

• Stud Type
Tube nuts save the day when studs are too short.

Compression Mount Frames

A good quality pair of very sharp end cutters are essential
There are several tools available for extracting stubborn bushings. A Scribe works better to open holes since it opens the front more, allowing for easier assembly.

A good compression tool is needed. Several types are available.

Close up on the compression mounting. The serrated prongs that push into the bushing.
Bushings for compression mounting

Remove old hardware by cutting the strap on the back surface of the lens

Press or pull the frame part out of the lens

Removal tools
The frame part will still have the bushing tubes around the prongs

Carefully nip off the bushing tubes

Insert a new bushing into the holes from the back side of the lens

Lightly grip the ends of the tubes and pull the strap tightly against the lens while pushing the strap against the lens

Keeping the cutter edges close to the tubes, slide the cutters to the front of the lens and cut the tubes

Open the crushed ends of the tubes with a scribe and aggressively wallow out the front
After placing the frame part into position, press the plier jaw firmly against the back strap.

While continuing pressure from the back, introduce the front plier jaw and compress into place.

Western optical #1050

Pliers for compression

- Hilco # 21-436

The compression is now complete

Nylon suspension mounting

- Interliners
- Avoiding chipped lenses
- Gauging string length
- Should you heat the string
- Using different thicknesses
- Keeping string from slipping
Insert lens into the top of the frame. Holding the two together, insert a ribbon and pull the string away from and around the lens.

When the string pops into the groove, pull one side of the ribbon to remove it.

Zyl-Top Rimless
Customizing for Security

• Temple tip modifications
• Extension tips for more “hook”
• Cable makers
• Permanent straps and harnesses
• Switching to silicone Pads & Tips

Customizing eyewear for special patient needs and comfort

• unusual facial characteristics requiring special frame reconditioning for visual and physical comfort.

Customizing for Extraordinary Needs

• Ptosis crutch
• Moisture chambers
• Wind protection
• Incorporating low vision aids
• Occlusion methods

Ptosis Crutch on Metal Frame

A Soft Shield and Occluded Lens
Various Moisture Chambers

Ear Difficulties

- Due to deformities
- Due to trauma
- How ears are reconstructed

Snuggle Wraps

- Open spaces allow for air circulation
- Each bar is cushioned in foam and covered in a soft cotton fabric
- Does not slip off wrist
- Not bulky - can be worn over or under clothes
- Friendly appearance

Ear Reconstruction

Reconstruction of traumatic ear deformity
Mastoid Process

Nose Difficulties
- Cancer surgery
- Hypertelorism

Hypertelorism

Nose Difficulties

Warning Graphic
Surgical Photos

Scottie’s Nose Cancer
Nose Difficulties

Cancer Surgery

• Warning: Graphic Images
Our Older Patients

making eyewear more comfortable for the aging population

- Looking at new Styles
Making eyewear more comfortable for the aging population

- Use smaller pads

A New Paradigm and Why

Wrapped Frames
Lenses Evolve!

- We are entering the future now
- Freeform lens processing is addressing problematic lens distortions we have been dealing with since eyewear was first invented.
- Some lens designers are calling this new technology “HD Vision” (High Definition)

Advanced Optics

- Lenses & Aberrations
- The Progressive Power Lens
  - Visual Challenges of PALs
    - Distance
    - Intermediate
    - Near

Lenses & Aberrations

- Spherical Aberration
- Distortion
- Marginal Astigmatism
- Coma

In any ophthalmic lens, a single ray passing along the visual axis of the eye & through the optical center of the lens is not refracted...

Spherical Aberration occurs because rays striking the periphery of the lens are refracted more than rays in the center of the lens...

...the magnification or minification in the lens periphery causes distortion
Aspheric lenses reduce distortion.

Spherical lens = constant radius of curvature
Aspheric lens = multiple radii of curvature

Marginal Astigmatism is unwanted peripheral astigmatism caused by differences between tangential & sagittal refraction.

Marginal Astigmatism can be reduced by proper selection of base curvature.

Coma is a high order aberration that causes image "flare" in the shape of a comet.

...coma is affected by the size of the lens stop (in the eye, the pupil).
Lenses & Aberrations

Progressive Power Lenses are subject to the aberrations common to every ophthalmic lens...

Coma

Patient Parameters

- **Pantoscopic Tilt**: the angle of the frame on the face
- **Wrap angle**: the angle of the frame itself
- **Vertex distance**: distance between the lens and the eye
- **Pupillary Distance**
- **Fitting Height**
Changes in wearing conditions

Changes in wearing conditions create aberrations

Understanding Measurements

Fitting Height

- Fitting Height is the measurement from the center of the patient’s pupil to the lowest point of the frame’s eyewire in millimeters
- Referred to as…
  - Fitting Height for PALs
  - Optical Center (OC Height) measurement for single vision wearers
  - Seg Height measurement for Bifocal vision wearers

PD

- Pupillary Distance (PD) refers to the distance between the patients pupils in millimeters

What about all these NEW measurements?

- Actually, measurements like Vertex, Pantoscopic Tilt and Wrap Angle (Position of Wear measurements) are not new
- Lens designers have been using average or “default” values when creating a new lens for years
- Now the ECP has the ability to take these measures for each patient individually – personalizing the product for that specific person

Vertex

- Vertex is the distance between the back surface of the lens and the apex of the cornea.
Pantoscopic Tilt

- Pantoscopic Tilt is the angle of the frame on the face in degrees.

Wrap Angle

- Wrap angle is the angle of the frame itself measured in degrees.

New Measurements

**Eye Data**
- ERC (Eye Rotation Center)

**Behavioral Data**
- Natural Head Posture (Head Cape)
- Head/Eye Ratio
- Stability Coefficient

Eye Rotation Center (ERC$_d$)

- Eye Rotation Center (ERC$_d$) is the distance between the back of the lens and the point around which the eye rotates.
- The ERC can be different for each eye.

Natural Head Posture

- Natural Head Posture (Head Cape Angle) refers to how a patient’s head rests naturally on the neck and shoulders. This has a direct impact on alignment of the design.

H/E Ratio & Stability Coefficient

- Some people move their head more to see things, while other people move their eyes more.
- The Head / Eye Ratio is a value that measures this.
- The Stability Coefficient determines how consistently the patient sticks to his or her H/E Ratio.
**Taking Measurements**

- **Standard Required Measurements**
  - Frame Measurements
  - Fitting Height (Seg Height)
  - PD (Pupillary Distance)
- **Position of Wear Measurements**
  - Pantoscopic Tilt
  - Wrap Angle
  - Vertex Distance
- **Behavior Measurements**
  - ERC
  - Head Cape or Natural Head Position
  - H/E Ratio
  - Stability Coefficient

**Manual Measurements**

- Position of wear measurements can be taken either manually or digitally.
- Varilux Patient Measuring Tool (LVAR200751)
- "How to Use" presentation available
- Video planned

**Distometer**

**Machinist’s Protractor**

**Frame Wrap Chart**
Zeiss I Terminal

The Smart Centration system from ABS, Inc., Smart Mirror

Hoya Spectangle

The Visioffice System

Bottom Line

- It’s all about focus
- Experiment with different systems
- Settle on a few good lens designs
- Pay attention to Patient’s lifestyle

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