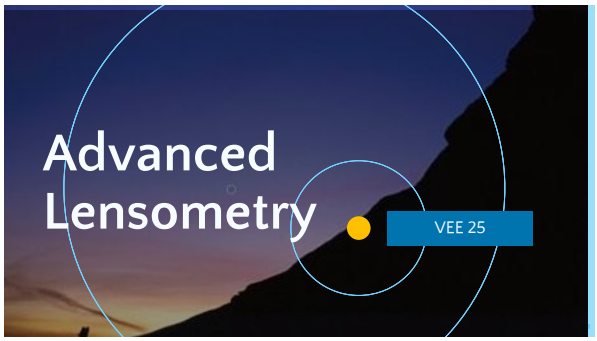

1

Today's workshop has a lecture and hands-on portion

2

The expectation in this workshop is that you have an understanding of:

- Focusing of manual focimeter/lensometer
- Reading the Back Vertex Power (Distance Power) of a lens (Sph, Cyl, Axis)
- Can accurately assess an ADD power in a Multifocal or PAL
- Can accurately measure with a PD ruler
- Basic Understanding of ANSI Z.80 Standards
- Have a basic understanding of Prentice's Rule

$$\Delta = (Pwr * dec)/10$$

Where:

Δ = prism diopters
Pwr= Dioptric value
dec = decentration (in mm)

3

3

$$\Delta = (Pwr * dec)/10$$

Where:

- Δ = prism diopters
- Pwr= Dioptric value
- dec = decentration (in mm)

4

4

Review of ANSI:

- What does the ANSI acronym stand for?
- What does purpose does ANSI serve?
- IN Opticianry, What are the ANSI standards we use most often?
-

5

5

Review of ANSI:

ANSI is a VOLUNTARY industry standard.

Discuss.

6

6

Review of ANSI:

ANSI Z80.1 – 2020 Prescription Ophthalmic Lenses, Recommendations

State Opticians laws in licensed states (CT and MA specifically)

ANSI Z87.1 – 2020 Occupational and Educational Personal Eye and Face Protection Devices

OSHA Federal Agency

7

7

HIGHLY RECOMMEND YOU PURCHASE ENTIRE STANDARDS

https://webstore.ansi.org/Standards/VC%20(ASC%20Z80)/ANSIZ802020-2436966

8

8

Most folks keep a "cheat sheet" for the ANSI Z80.1 next to their lensometer for reference…

Make sure it is the latest, 2020

ALSO make sure you know how to read it.

https://thevisioncouncil.org/sites/default/files/assets/media/ANSI_Z80-1-2020_QuickReferenceGuide.pdf

due to potential copyright we will not distribute this

9

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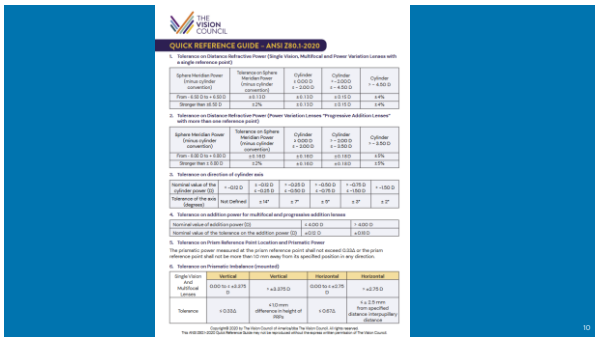

THE VISION COUNCIL

QUICK REFERENCE GUIDE – ANSI Z80.1-2020

1. Tolerance on Distance Refractive Power (Single Vision, Multifocal and Power Variation Lenses with a single reference point)

Sphere Meridian Power (minus cylinder convention)	Tolerance on Sphere Meridian Power (minus cylinder convention)	Cylinder ≤ 0.00 D ≤ – 2.00 D	Cylinder > – 2.00 D ≤ – 4.50 D	Cylinder > – 4.50 D
From – 6.50 D to + 6.50 D	±0.13 D	±0.13 D	±0.15 D	±4%
Stronger than ±6.50 D	±2%	±0.13 D	±0.15 D	±4%

2. Tolerance on Distance Refractive Power (Power Variation Lenses "Progressive Addition Lenses" with more than one reference point)

Sphere Meridian Power (minus cylinder convention)	Tolerance on Sphere Meridian Power (minus cylinder convention)	Cylinder ≤ 0.00 D ≤ – 2.00 D	Cylinder > – 2.00 D ≤ – 3.50 D	Cylinder > – 3.50 D
From – 6.50 D to + 6.50 D	±0.18 D	±0.18 D	±0.18 D	±5%
Stronger than ± 6.50 D	±2%	±0.18 D	±0.18 D	±5%

3. Tolerance on direction of cylinder axis

Nominal value of the cylinder power (D)	–0.12 D	> –0.12 D ≤ –0.25 D	> –0.25 D ≤ –0.50 D	> –0.50 D ≤ –0.75 D	> –0.75 D ≤ –1.50 D	> –1.50 D
Tolerance of the axis (degrees)	Not Defined	±14°	± 7°	± 5°	± 3°	± 2°

4. Tolerance on addition power for multifocal and progressive addition lenses

Nominal value of addition power (D)	≤ 4.00 D	> 4.00 D
Nominal value of the tolerance on the addition power (D)	±0.12 D	±0.18 D

5. Tolerance on Prism Reference Point Location and Prismatic Power

The prismatic power measured at the prism reference point shall not exceed 0.33Δ or the prism reference point shall not be more than 10 mm away from its specified position in any direction.

6. Tolerance on Prismatic Imbalance (mounted)

Single Vision And Multifocal Lenses	Vertical	Vertical	Horizontal	Horizontal
	0.00 to + 0.375 D	+ 0.375 D	0.00 to + 2.75 D	+ 2.75 D
Tolerance	± 0.33Δ	± 1.0 mm difference in height of PRPs	+ 0.67Δ	± 2.5 mm from specified distance interpupillary distance

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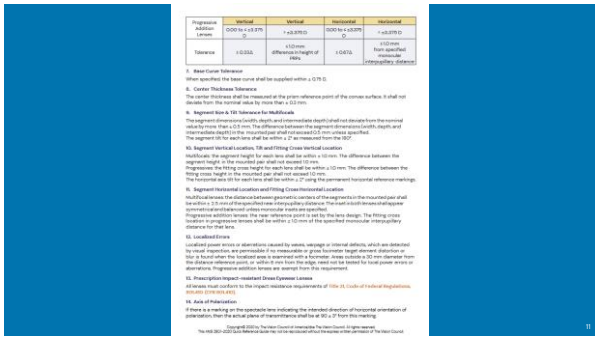


Progressive Addition Lenses	Vertical	Vertical	Horizontal	Horizontal
	0.00 to + 0.375 D	+ 0.375 D	0.00 to + 2.75 D	+ 2.75 D
Tolerance	± 0.33Δ	± 1.0 mm difference in height of PRPs	+ 0.67Δ	± 2.5 mm from specified monocular interpupillary distance

7. Base Curve Tolerance

When specified, the base curve shall be supplied within ± 0.75 D.

8. Center Thickness Tolerance

The center thickness shall be measured at the prism reference point of the convex surface. It shall not deviate from the nominal value by more than ± 0.2 mm.

9. Segment Size & Tilt Tolerance for Multifocals

The segment dimensions (circle width, depth, and D-segment depth) shall not deviate from the nominal value by more than ± 0.5 mm. The difference between the segment dimensions (width, depth, and intermediate depth) in the mounted pair shall not exceed 0.5 mm unless specified.
The segment tilt for each lens shall be within ± 2° as measured from the 180°.

10. Segment Vertical Location, Tilt and Fitting Cross Vertical Location

Segment height of the mounted pair shall not exceed 2 mm ± 1.0 mm. The difference between the segment right or left mounted pair shall not exceed 1.0 mm.
Progressives: the fitting cross height for each lens shall be within ± 1.0 mm. The difference between the fitting cross height in the mounted pair shall not exceed 1.0 mm.
The horizontal axis tilt for each lens shall be within ± 2° using the permanent horizontal reference markings.

11. Segment Horizontal Location and Fitting Cross Horizontal Location

Multifocal lenses: the distance between geometric centers of the segments in the mounted pair shall be within ± 2.5 mm of the specified near interpupillary distance. The near visual both lenses shall be symmetrical and balanced unless monocular inserts are specified.
Progressive addition lenses: the near reference point is set by the lens design. The fitting cross location in progressive lenses shall be within ± 1.0 mm of the specified monocular interpupillary distance for that lens.

12. Localized Errors

Localized power errors or aberrations caused by waves, wayvage or internal defects, which are detected by visual inspection, are permissible if no measurable or gross lozimeter target element distortion or blur is found when the localized area is examined with a lozimeter. Areas outside a 30 mm diameter from the distance reference point, or within 6 mm from the edge, need not be tested for local power errors or aberrations. Progressive addition lenses are exempt from this requirement.

13. Prescription Impact-resistant Dress Eyewear Lenses

All lenses must conform to the impact resistance requirements of Title 21, Code of Federal Regulations, 801.410. [CFR 801.410].

14. Axis of Polarization

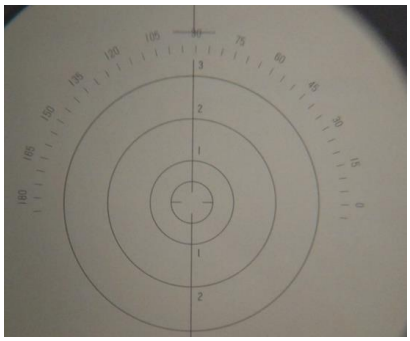
If there is a marking on the spectacle lens indicating the intended direction of horizontal orientation of polarization, then the actual plane of transmittance shall be at 90 ± 3° from this marking.

11

Reticles diagram

Know your device

12



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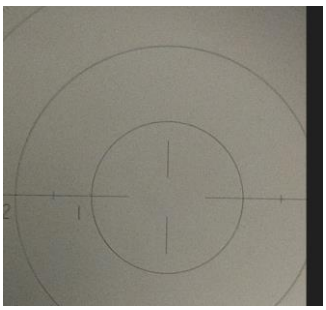

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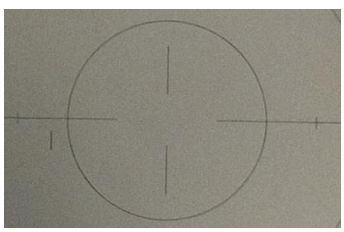

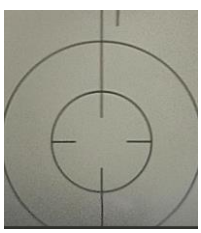

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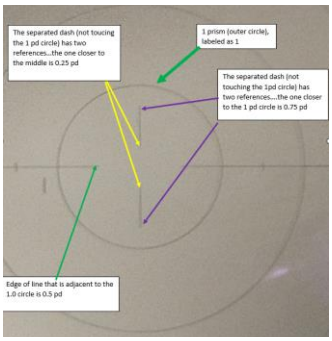

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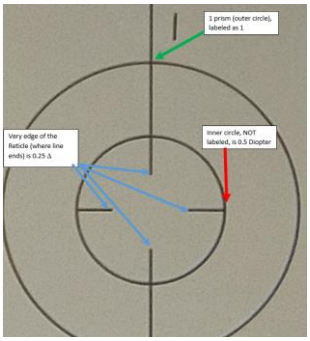

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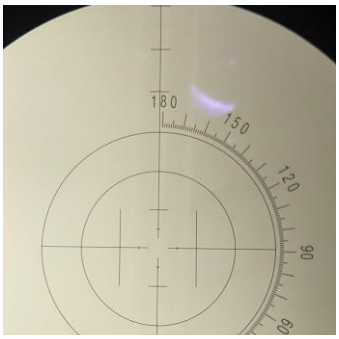
Just to confuse the matter, there are even MORE!!!!

Today's lab has a few different reticle types

18



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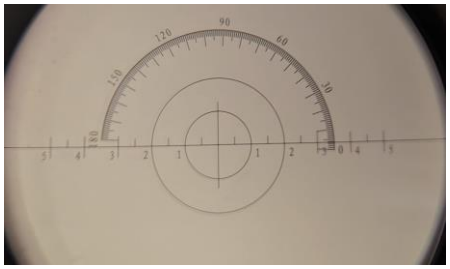

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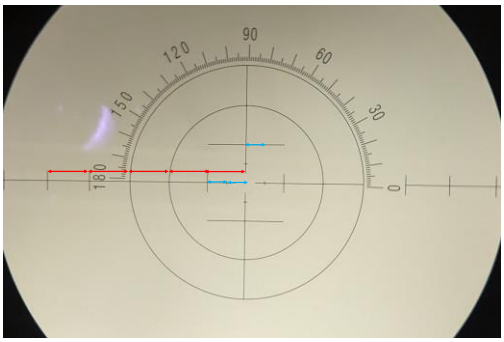

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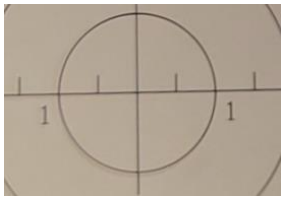

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Prism notation

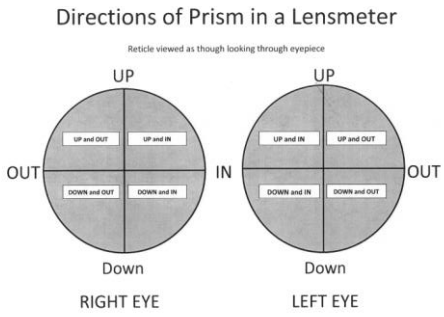
Horiz amount and direction with Vertical Amount and direction

Or

Base at a specified Angle

23

23



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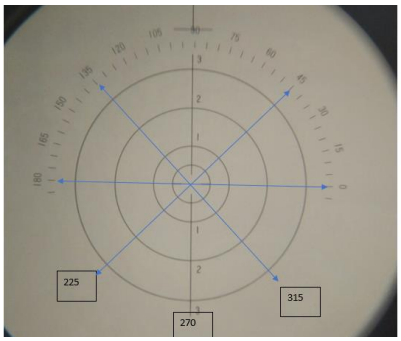

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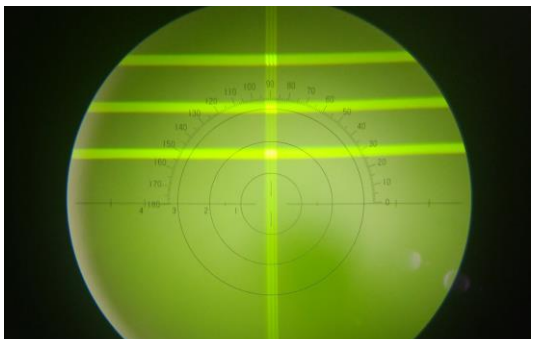

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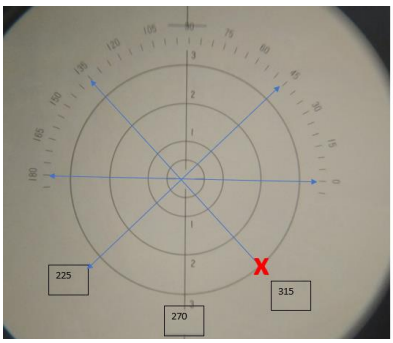

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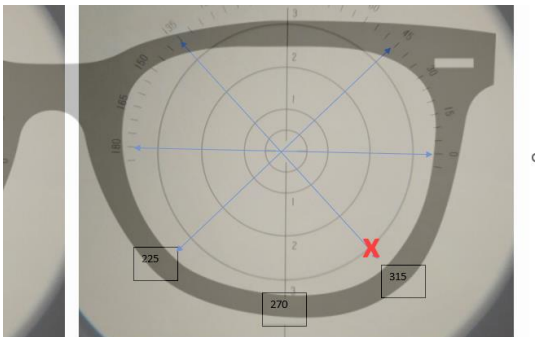

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Given the following Rx:

OD -1.00 sph prism 3 Δ @135

OS -2.00 sph prism 3 Δ @ 315

Add +2.25 OU

The prism in the OD would best be described as:

a. Up and Out
b. Up and In
c. Down and Out
d. Down and IN

The Prism in the OS would best be described as:

a. Up and Out
b. Up and In
c. Down and Out
d. Down and IN

29

29

ANSI standards and applications:

- **Check Dist Power tolerance**
- **Check Cyl Power Tolerance**
- **Check Axis Tolerance**
- **Check ADD**

- **Determine vertical imbalance**
- **Determine Horizontal imbalance**

- **Seg vert and horizontal or Fitting Cross Vert and Horiz**

30

30

ANSI standards and applications:

- **Also don't forget**
  - **BC (really?)**
  - **CT**
  - **Segment Size and tilt**

31

31

ORDERED

-2.00 -0.25 x 180

- Step 1 check SPH power
  - Accept ANYTHing within 0.13
  - OK from -1.87 to -2.13
- Step 2 check CYL power
  - Accept anything withing 0.13
  - OK from -0.12 to -0.38
- Step 3 check Cyl AXIS
  - Accept anything within 14 degrees
  - 166 to 014

RECEIVED

- **-2.00 -0.25 x 005**

32

32

ORDERED

-2.00 -0.25 x 180

- Step 1 check SPH power
  - Accept ANYTHing within 0.13
  - OK from -1.87 to -2.13
- Step 2 check CYL power
  - Accept anything withing 0.13
  - OK from -0.12 to -0.38
- Step 3 check Cyl AXIS
  - Accept anything within 14 degrees
  - 166 to 014

RECEIVED

-1.88 -0.33 x 168

OK
= OK

33

33

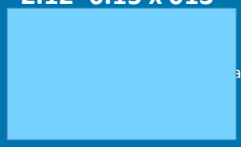
ORDERED

-2.00 -0.25 x 180

- Step 1 check SPH power
  - Accept ANYTHing within 0.13
  - OK from -1.87 to -2.13
- Step 2 check CYL power
  - Accept anything withing 0.13
  - OK from -0.12 to -0.38
- Step 3 check Cyl AXIS
  - Accept anything within 14 degrees
  - 166 to 014

RECEIVED

-2.12 -0.15 x 013



ansi, so

34

34

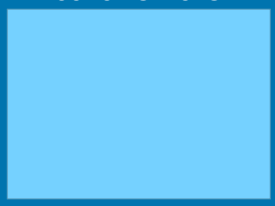
ORDERED

-2.00 -0.25 x 180

- Step 1 check SPH power
  - Accept ANYTHing within 0.13
  - OK from -1.87 to -2.13
- Step 2 check CYL power
  - Accept anything withing 0.13
  - OK from -0.12 to -0.38
- Step 3 check Cyl AXIS
  - Accept anything within 14 degrees
  - 166 to 014

RECEIVED

-2.00 -0.25 x 015



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35

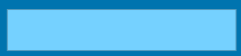
ORDERED

-10.00 -3.00 x 0180

1. check SPH power
   Accept ANYTHing within 2%
   Accept anything withing 0.2
   Anything between -9.80 and -10.20 is within tolerance
2. check CYL power
   Accept anything within 0.15
   Accept anything between -2.85 and -3.15
3. check Cyl AXIS
   Accept anything within 2 degrees
   178-002

If RECeived:

-9.85 -3.10 x 178



If Received

-10.00 -3.00 x 003

36

36

ORDERED

2% = power * 2, and move decimal to the left 2 spots

2% of 10 = 0.2
2% of 9 = .18
2% of 14 = .28

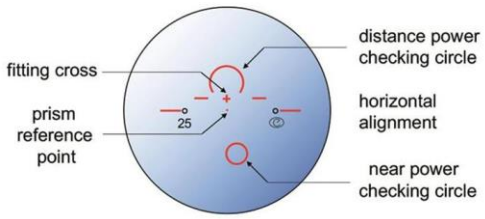
37

37

You order the following pair of eyewear:

38

38



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