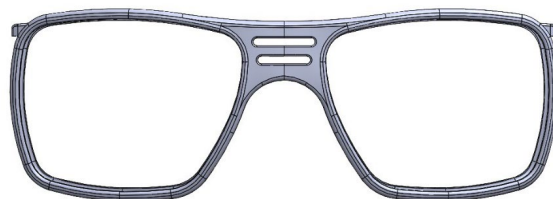


Optician Guide for the 3M™ Universal Spectacle Kit 102

Description

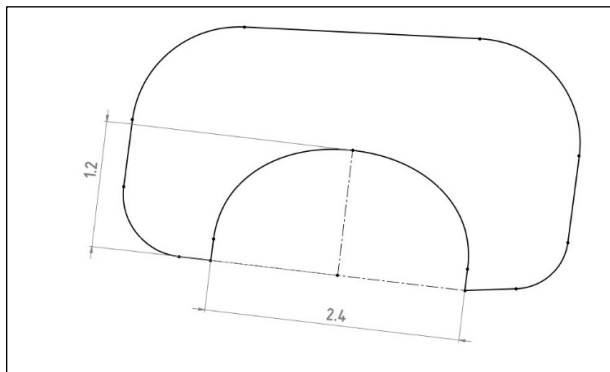
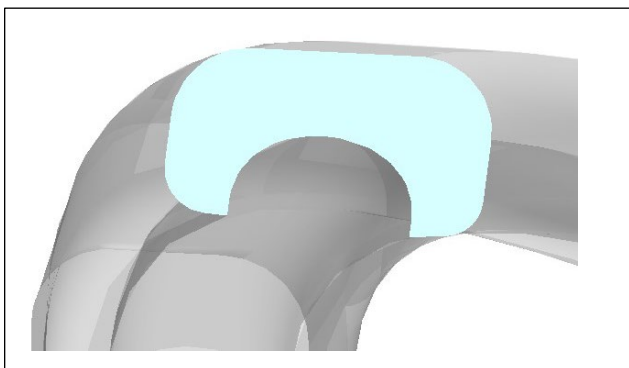
The 3M™ Universal Spectacle Kit 102 allows the wearer to use corrective lenses with certain 3M Full Facepiece Respirators. The universal spectacle kit includes many parts (3 wire frames, 1 spectacle frame, 1 frame clip, 2 rubber slides and prescription insert). This guide is meant for optician use and will focus on glazing of the spectacle frame.



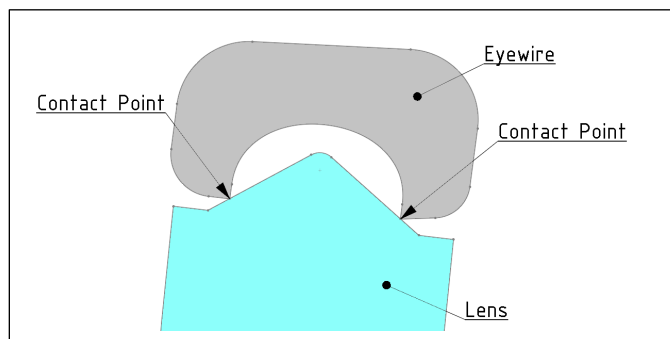
Spectacle Frame

Spectacle Frame

The lens groove of the spectacle frame included in the 3M™ Universal Spectacle Kit 102 has a semi-circular shape, different from the V-groove found on “streetwear” frames.

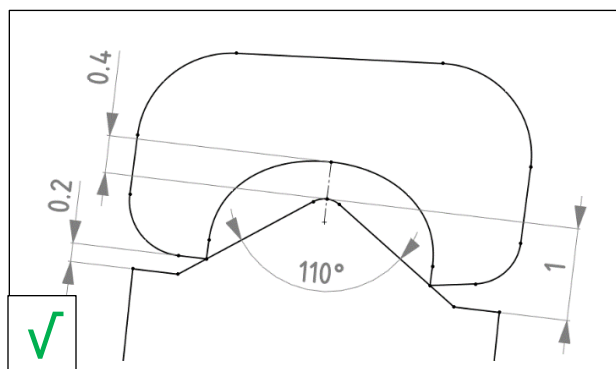
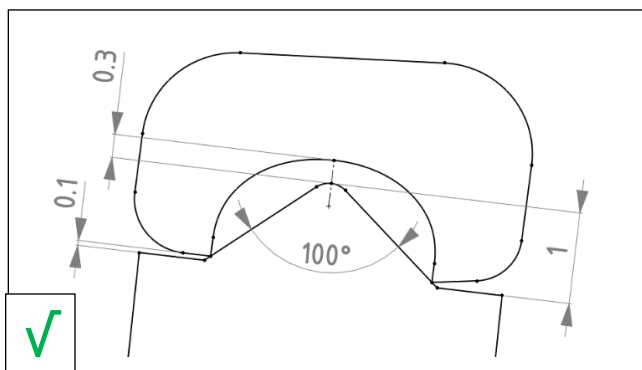


This cross section shows how the glazed lens is held in the eyewire:



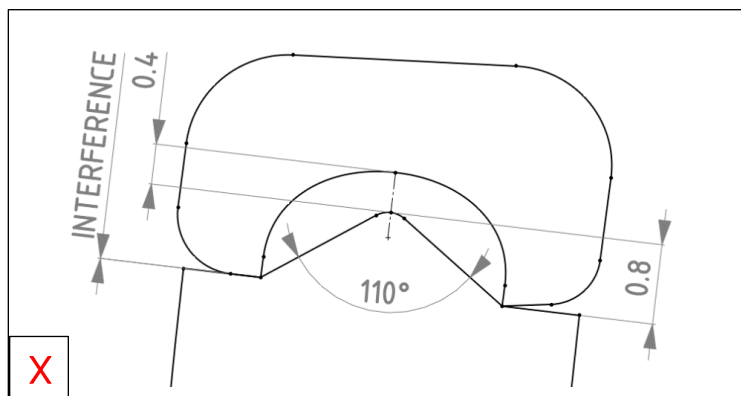
In any point along the lens shape, there are 2 contact points. The lens is held in the eyewire by the edges of the eyewire groove, without contact of the lens bevel tip in the eyewire groove.

The space between the eyewire groove bottom and lens bevel tip varies with the angle of the lens bevel as well as the bevel height. Below are examples of the lens fitting in the eyewire groove with a commonly used edging bit for *safety* eyewear glazing. This is the edging bit we recommend be used.



Note: In both examples, there is a minimum gap between the lens “flat” surfaces and the eyewire groove edges.

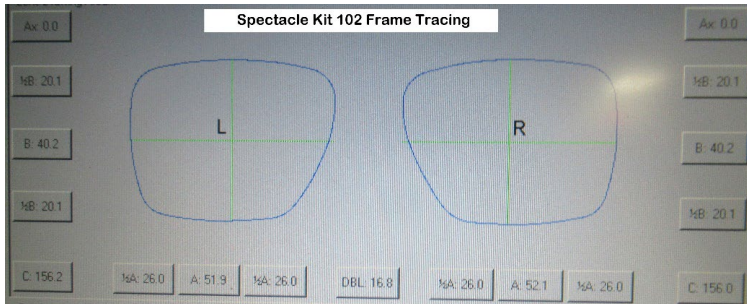
We do **not** recommend the use of a “streetwear” edging bit. When using a “streetwear” edging bit, bevel height 0.8mm and bevel angle 110°, there is an interference between the lens flat surfaces and the eyewire inner surfaces. This will increase the stress on the eyewire, and may increase the risk of lenses popping off the frame upon impact.



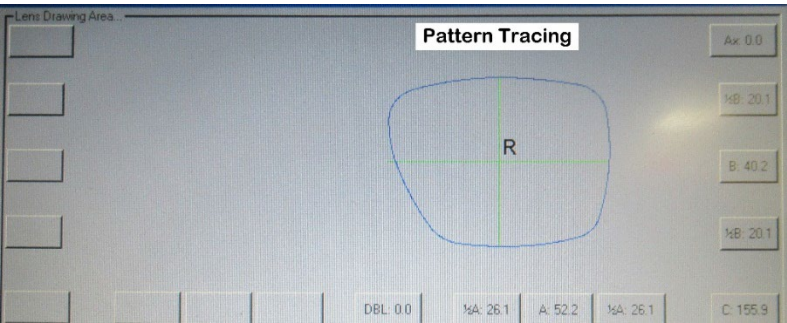
Note the distance between the lens bevel apex and the eyewire groove bottom varies according to the type of bit used.

Frame and Pattern Tracing

The pattern provided with the Universal Spectacle Kit 102 is a match for the bottom of the eyewire groove tracing. The tracing shown here is for the spectacle kit frame, with “boxing” nominal dimensions 52 x 40 mm. Please note that there is a slight difference between the left and right eye size with Left Eye measured at 51.9 x 40.2mm, Right Eye measured at 52.1 x 40.2, all dimensions well within ANSI standard Z80.5-2010 tolerances ($\pm 0.25\text{mm}$).



Pattern dimensions match the frame “bottom of groove” dimensions.



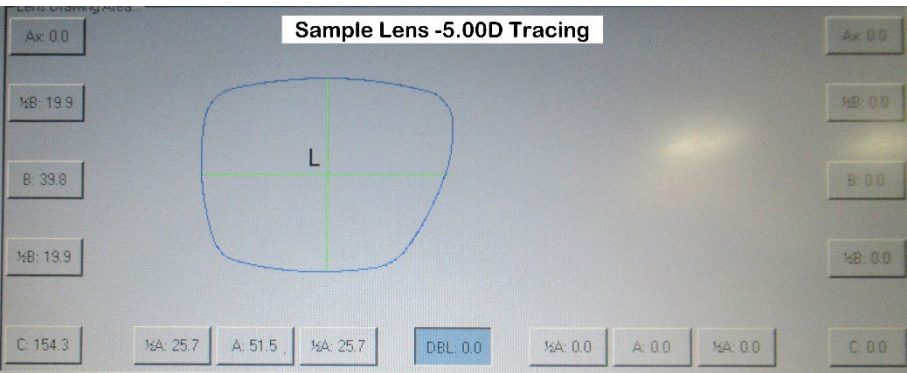
Edging the lenses using the pattern

For best lens retention, it is recommended to use **dry-cut** edgers such as National Optronics 7Ex, as the small rotation diameter of the bit allows for a more uniform lens bevel profile. Edging bit should have a 100° to 110° bevel angle with a minimum bevel height of 1mm.

It is highly recommended to use polycarbonate prescription lenses, those polycarbonate lenses are not shatter proof but have been found to have much higher impact resistance than CR39 or high index plastic materials.

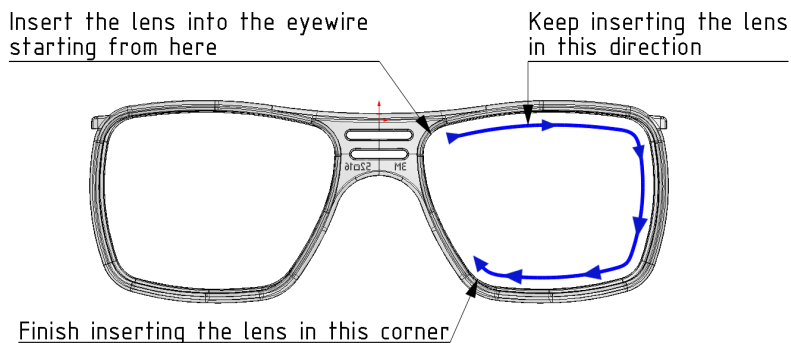
Adjust the edger to same size as the pattern, do **not** oversize the lens as this will stress the spectacle frame and may ultimately reduce the lens retention.

3M Personal Safety Division successfully glazed test lenses cut to a dimension **51.5 x 39.8 mm** using a 110° bit with a height of 1mm.

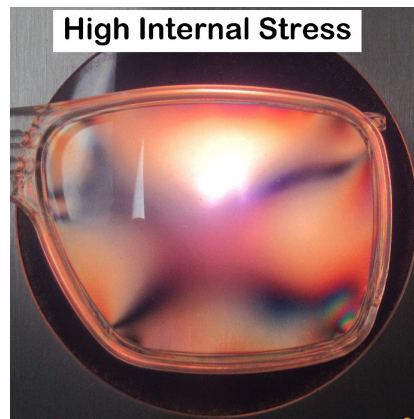
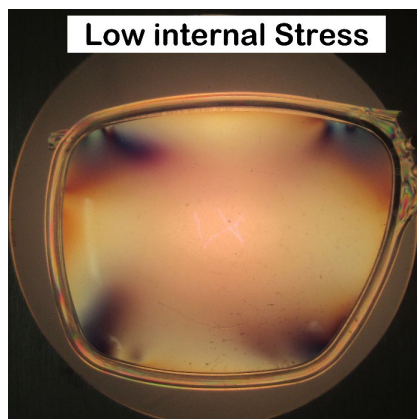


Key Steps:

- Cut the lens to pattern size
- Keeping the block onto the prescription lens
- Insert the lens in the frame starting by the nasal corner as shown below
- **Do not heat the frame**
- If the lens bevel does not snap into the eyewire groove, reduce lens size by 0.25 mm total (0.125 mm radially)
- Try inserting the lens again
- If the insertion is too hard, then reduce lens size by 0.1mm total
- It may be required to adjust the lens size several times to get the optimum size



It is important to check the lens internal stress using a polariscope, as too much stress will increase the risk of lens cracking. In the “low internal stress” image, low stress is limited to the lens “4 corners”, and stress fringes have only 2 bands that do not extend far into the lens.



In comparison, highly stress lens show fringes of different colors, especially on the temporal bottom corner of the lens, and the stress fringes extend almost to the center of the lens as shown in the “high internal stress” image.

Cleaning the frame and lens

Polycarbonate lenses as well as polyamide material used for the frame can be damaged by solvents. Do NOT use Isopropanol, acetone, MEK or other solvents to clean the frame or lenses. If cleaning is required, use lukewarm water and soap and rinse with water.

**Personal Safety Division**

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