

Re: variable focal length eyeglass lens question

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I claim no specific expertise in this field, but there are numerous variations on the progressive lens technique. Each one attempts to optimize the transition zones, both in where the transition occurs, and how the transition is managed; "optimize" may be a loose term, however. Your new glasses may have a different variation from your previous prescription. I wear progressives, but feel that they are "OK for all conditions, but ideal for no conditions". You may want to discuss the different variations with a knowledgeable ophthalmologist; mine specifically recommended the Rodenstock (can't remember their trade name), but my supplier couldn't get it.

You might also try asking your question on sci.med.vision.

HTH,
Joe

Clayton Weaver wrote:

- > *I have a question about "progressive lenses" (variable*
- > *focal length eyeglass lenses, designed to perform the same*
- > *function that bifocals or trifocals perform without the*
- > *abrupt transitions between the areas of different focal*
- > *length).*
- >
- > *I got my first pair of these lenses about 10 years ago. Those*
- > *worked perfectly, and (with the lenses more-or-less the same*
- > *distance from my eyes) the focal lengths matched no matter*
- > *what my angle of view through the lenses was.*
- >
- > *Recently I purchased a new pair of glasses, again with*
- > *progressive lenses, but naturally at a stronger*
- > *magnification 10 years after the last pair. Trying these new*
- > *glasses, I find that the focal lengths match in the center*
- > *of the lens, but if I swivel my eyes more than about 15*
- > *degrees to the left or right, it is so blurry that I have*
- > *difficulty reading 80x25 text on a crt monitor sitting 2-3'*
- > *away from it. (The same text is perfectly clear if viewed*
- > *straight on from the same vertical angle and distance.)*

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- >
- > *The area of usable focal length matching widens a bit toward*
- > *the top and bottom of the lenses, but not at the same rate*
- > *on both sides. (I can swivel my eyes farther to one side*
- > *than the other before getting dizzy, etc.)*
- >
- > *I don't have astigmatism or any other similar condition,*
- > *I am merely nearsighted without glasses.*
- >
- > *I explained my doubts about whether these lenses had been*
- > *correctly milled and polished for my prescription to the*
- > *head clerk at the optician's place of business. Apparently*
- > *not noticing my virtual propeller beanie, she asserted that*
- > *this problem was inherent in progressive lenses, and perhaps*
- > *I might need bifocals instead.*
- >
- > *Suspiciously enough, no one at this optician's office*
- > *seemed to have had the faintest notion of any generic*
- > *problems with progressive lenses until I reported that these*
- > *were blurry on the sides; not the owner when I asked whether*
- > *these somewhat skimpy on the lens area frames could be used*
- > *with variable focal length lenses, not the eye doctor when*
- > *she asked me what kind of lenses I wanted, and not the clerk*
- > *that asked me whether I wanted bifocals or progressive*
- > *lenses when she entered my lens order into their computer.*
- > *They have display cases full of frames with lenses approximately*
- > *the same size as these, so if problems like this were*
- > *common with progressive lenses at any magnification, one would*
- > *expect that everyone in the office would know about it.*
- >
- > *It seems to me from my distant memory of analytic geometry*
- > *et al that a function capable of computing a shape that*
- > *matches focal lengths at more than point on a pair of lenses*
- > *in a particular frame, given all of the relevant variables*
- > *like measurements of the native focal length and any motion*
- > *skew of the lenses of the eyes, position of the eyeglass*
- > *lenses relative to the eyes for a certain frame style and*
- > *eye position, the size and outline of the lens area, the*
- > *optical properties of the lens material, and the desired*
- > *focal length gradient, can compute a lens shape that matches*
- > *focal lengths everywhere in the lenses, up to within a*
- > *millimeter or two of the edge of the lenses. After that it's*
- > *a simple matter of letting a computerized milling machine*
- > *have at the lens blanks, polishing out any tool marks*
- > *and applying any specified lens coatings (anti-UV,*
- > *anti-glare, scratch resistance, etc).*
- >
- > *At least this was my experience with my previous set of*
- > *progressive lenses.*
- >
- > *While I know what the relationship is between derivatives*

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- > *and integrals and in general how multi-variable problems of*
- > *this nature are solved mathematically, I am not an optics*
- > *engineer, so I'm withholding lawsuit, BBB complaint, pipe*
- > *bomb, etc, until I get some opinion on the technical*
- > *question informed by expert knowledge of eyeglass lens design,*
- >
- > *Is this problem inherent in the design of progressive*
- > *lenses (something I didn't see with my last pair), or is that*
- > *assertion inconsistent with physics and modern lens materials?*
- >
- > *Comments?*
- >
- > *Regards,*
- >
- > *Clayton Weaver*
- > *<mailto:cgweav@aol.com>*
- >
- > *"Everyone is ignorant, just about different things." Will Rogers*