

Optical quality of the ready-made reading spectacles marketed in non-sanitary shops

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Purpose

Analysing the optical quality of the lenses in ready-made reading spectacles marketed in non-sanitary shops, according to the current European Standard (ISO 16034:2002).

Method

This project tested the spherical, cylindrical, and prismatic power of 132 lenses (RE/LE) from 66 ready-made reading spectacles, using the spectrometer / frontofocometer Humphrey Lens Analyzer 360 with Spexan. Their fulfilment of the current standard was checked, which states a tolerance up to 0.12D for spherical power, 0.09D for cylindrical power, and 0.33D for prismatic power. The measurements of spherical and cylindrical power were taken in the optical centre of the lens. The prismatic power was figured out by means of Prentice's Law, considering a nasopupilar distance of 32mm to find out the horizontal de-centring, and the difference between eye height to find out the vertical de-centring.

Results

The test results showed that 44% of the ready-made reading spectacles studied have lenses which do not fulfill the current standard. All the tested spectacles are defective for powers +1.75D, +2.75D, +3.75D, and +4.00D. Spherical defects were present in 23% of all tested spectacles, although this percentage was higher in those spectacles with more powerful lenses. All spectacles with a power over 3.00D showed spherical power errors, up to 0.56D. Regarding the defects related to cylindrical and prismatic power, a 3% of spectacles showed cylinder-related defects, a 29% showed horizontal prismatic aberrations, and a 6% showed vertical prismatic aberrations. In some cases, lenses showed one, two or more defects.

Conclusion

44% of tested ready-made reading spectacles have lenses which do not fulfill the current standard. Visual explorations and previous optometric prescriptions by sanitary staff experts in vision sciences can avoid the unsuitable use of ready-made reading spectacles, since they show a high percentage of defects in their optical quality and considering inappropriate self-prescriptions.