

MANUFACTURING ERRORS TRIAL



A double masked wearer trial was carried out to evaluate the effect of the lenses manufacturing quality in the visual performance. All participants compared the same lens design with and without induced errors during the manufacturing process.

LENS DESIGN



Alpha H45 (balance design) with and without simulated manufacturing errors

MANUFACTURING ERRORS



- Central dot error
- Rings error

TESTING PERIOD



7 days for each pair of eyeglasses

SAMPLE SIZE

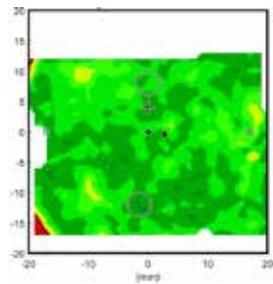


- 19 wearers (central dot error group)
- 17 wearers (rings error group)

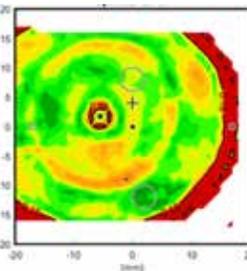
LENSES MANUFACTURING PROCESS

The accuracy in the lens manufacturing process is crucial to obtain a final high quality product. If any issue occurs during the blocking, generating, polishing, or engraving phases, it can directly affect lens quality and therefore its performance. In this trial, participants compared their visual experience when using lenses correctly produced and lenses produced with errors in order to know the effect the manufacturing process has on the wearer's visual experience. Two typical error patterns were induced: central dot error and rings error.

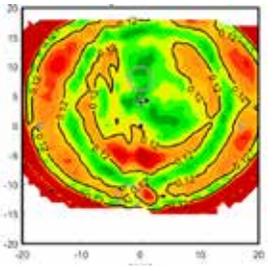
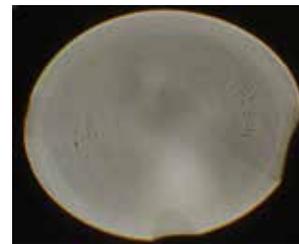
GOOD PRODUCTION



CENTRAL DOT ERROR



RINGS ERROR

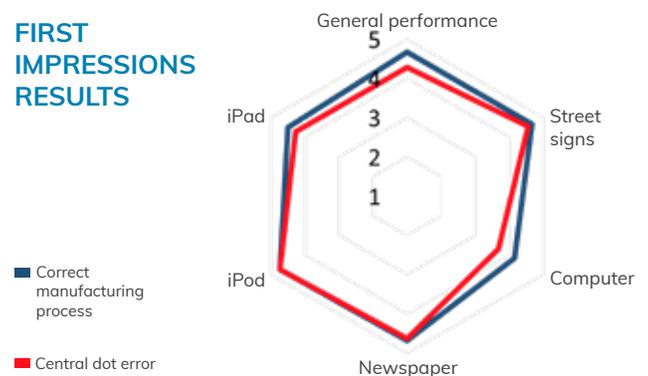


FIRST IMPRESSIONS

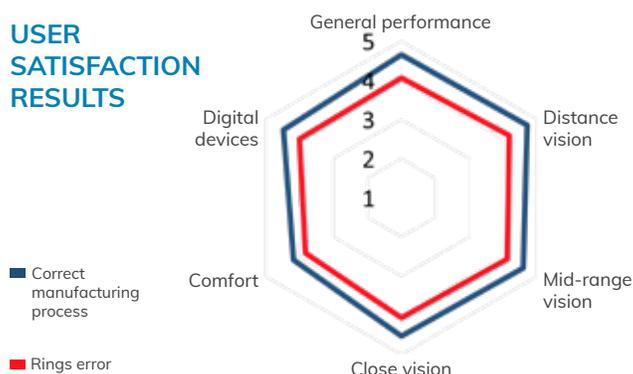
The visual experience of subjects the first time they use a new PPL plays an important role in their general satisfaction. For this reason, first impressions with each lens design were evaluated. Participants were guided by expert optometrists to do several tasks in a simulated controlled environment. For each task, they had to score the lens performance on a scale from 1 to 5, with 1 being poor and 5 being best.

Satisfaction rates decrease for lenses with CENTRAL DOT ERROR, indicating a loss of the "wow" effect desirable when delivering a new pair of lenses. Due to the position of the error in the center of the corridor, computer vision is the most affected task.

FIRST IMPRESSIONS RESULTS



USER SATISFACTION RESULTS



USER SATISFACTION

Wearers' satisfaction depends on the capability of the lens design in providing a good visual performance when doing their daily activities. For this reason, participants were asked to use each pair of lenses for 7 days during their daily routine and score their general satisfaction from 1 to 5, with 1 being poor and 5 being best, for the different distances/tasks.

After 7 days of use, lenses produced with RINGS ERRORS presented similar satisfaction rates as those given in the first impressions evaluation. Satisfaction decreases dramatically. This fact seems to indicate that production errors produce a decrease of visual quality and more adaptation difficulties.

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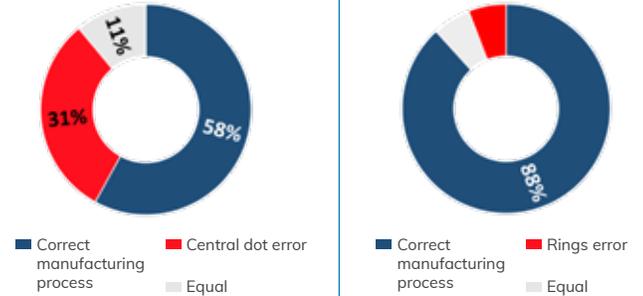


PREFERENCE

Wearer preference is the most interesting point when comparing 2 lens designs because it provides information about the differences in performance between the lenses that the wearer has tested. To analyze this, participants were asked their preferred lens choice after using both pairs of eyeglasses for 7 days (randomized order).

As expected, most of the wearers indicated a preference for the correctly produced lenses, which shows the benefits of optimizing the production process in the final performance of the lens. Rings errors are more noticeable by the wearers than the central dots errors.

PREFERENCE RESULTS



ADAPTATIONS & REJECTIONS

GOOD PRODUCTION **100%** of participants **adapted** in 3 days or less

CENTRAL DOT ERRORS **11%** of participants **rejected** the lenses after 7 days

RINGS ERRORS **6%** of participants **rejected** the lenses after 7 days

ADAPTATION PERIOD

Another important point to determine the performance of a lens is related to the time that a patient needs to completely adapt to the lenses. The percentage of wearers who adapted to the lenses in 3 days or less and the percentage of wearers who rejected the lenses after using them for 7 days were recorded.

The adaptation process was easier and more successful in lenses produced without manufacturing errors, indicating the importance of production quality in the adaptation process.

CONCLUSIONS

The quality of production is a key factor for improving wearer satisfaction, creating a "wow" effect, and improving the adaptation process for the wearers.

IOT offers full technical service support to help laboratories improve their manufacturing process and produce the best lens designs with the best quality. Contact IOT for more information.