**FEMTO LDV Z8**

**LASIK and Pockets**

**Precision in diverse corneal applications with the FEMTO LDV Z8 cataract femtosecond laser**

**Background**
Refractive surgeries performed with the aid of precision laser platforms are on the rise. While applications vary, arguably the most popular femtosecond surgical procedures involve LASIK flaps and cataract operations. Both small- and large-scale medical practices across the globe either now use a femtosecond laser surgical platform or will integrate one into their clinical workflow in the coming 10 years. To date, five laser platforms exist which have the capability to perform laser assisted cataract surgeries (LACS), of these only three can also create LASIK flaps and perform other corneal applications. The Ziemer LDV Z8 femtosecond laser is unique among femtosecond laser platforms as aside from performing LASIK, cataract and corneal functions (intracorneal rings, pockets, keratoplasty and incisions), it is also significantly more compact and mobile than competing devices. The aim of the present study was to analyze the LASIK and intrastromal pocket performance of the FEMTO LDV Z8, a device which is currently used widely for cataract applications.

**Methods**
Five-hundred-and-thirty-nine randomly selected 1-day-old porcine eyes were surgically cut with the FEMTO LDV Z8 in the present study. LASIK flap thickness and flap diameter in both 2-D and 3-D LASIK cuts were recorded (30° side-cut angle for 3-D flaps). Intrastromal pockets were also assessed for pocket and tunnel quality using a subjective quality rating scale by two trained lab technicians. All flaps were cut with the factory settings (for 3-D Z-LASIK flaps, round, anterior diameter 9.0) using Viscoelastic. For box and whisker plots the Tukey whiskers extend to data points that are less than 1.5×IQR away from 1st/3rd quartile.

**Results**
The FEMTO LDV Z8 performed both 2-D and 3-D LASIK flaps in a precise and repeatable manner. For 2-D LASIK flaps, target flap thickness was set at 120 μm with average achieved thickness deviating by only 3 μm (mean target flap thickness ±SD: 123.1±3.5 μm; range, 115-128 μm; n=482). For 3-D LASIK flaps, target flap thickness was also set at 120 μm with average achieved thickness almost identical to 2-D flaps (mean target flap thickness ±SD: 123.4±3.3 μm; range, 116-128 μm; n=501). Three-dimensional flaps were then measured against their target diameter of 9.0 mm and it was found that most samples achieved the target cut diameter within 0.1 mm (average measured flap diameter: 9.1±0.2 mm; n=539). For intracorneal pockets, pocket and tunnel quality was rated on a 1-4 scale with 4 representing highest quality. Both pocket and tunnel quality was found to be very good (average rating for pockets: 3.9±0.1; n=275; for tunnel: 3.9±0.1; n=275).

**Conclusions**
The FEMTO LDV Z8 laser is a diverse tool that is able to perform a variety complex surgical tasks with high precision. Besides its main function as a cataract platform, we found that the FEMTO LDV Z8 is also adept at corneal pockets and multiple LASIK applications, making it one of the most cross-functional devices for corneal and refractive surgery on the market.

More information on cut performance with other FEMTO LDV Z Series lasers can be found in the 2011 publication by Ahn, H. et al., J Cataract Refract Surg.

Authors:
C. Hugounenq PhD, S. Moyle PhD, T. Asshauer PhD.

Testing performed at the research labs of Ziemer Ophthalmic Systems AG, Port, Switzerland.