

**FuDe**

**FUDE MEDPHOTONIC  
2024**



**CE FDA NMPA**

**Explore the  
Lighting of Surgical**

# ***FuDe*** **Content**

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Company Intro

# FuDe

**Zhejiang FuDe  
Medphotonic Co., Ltd**

**Wholly - Owned  
Subsidiary (Shanghai):**

**Shanghai Fudekang Medical  
Lighting Equipment Co., LTD**

**Fudan University  
FuDe Advanced Optics  
Joint R&D Center**

### Back ground

Zhejiang FuDe Medphotonic Co., Ltd is a joint venture company started by a University-enterprise joint project with the support of Fudan University and New Minghui Electric Lighting Co, founded in 2019 with the registered capital of 10 million RMB and core technology of optical path design and Fundamental research capability of LEDs.

### Facility & Capability

With a 2000m<sup>2</sup> manufacturing base in Zhejiang Province, China and and a R&D center lead by two experts of the National "Thousand Young Talents" FuDe Medphotonic Co have successfully launched its 3 product line- "Aspholight" series of surgical head light ,Galileo series of surgical binoculars and 4K camera system(under clinical pre-market testing)

Based on FuDe's full capability of R&D and manufacturing and logistics, OEM and ODM services remains important business part of the company.

FuDe is on the road to explore the lighting and surgical globally.

Leading Talent

# FuDe



Leading Talent, President

CEO



**MinBiao, Ji**

Professor and doctoral director of Fudan University

(2014-present)

- Department of the CPC Central Committee "ThousandTalents Program (Youth Group)"(2015)
- "Young Star of Science and Technology" of Shanghai (2015)
- The Ministry of Science and Technology "Digital Medical Equipment" program Chief Scientist
- Standing Member of Biomedical Photonics Branch, OpticalSociety of China
- National Excellent Self-funded Abroad Student Award (2010)
- Deputy leader of Chinese Biomedical Photonics Society Youth Group



**Yue, Qian**

Owner of LEDs and batteries business with 30 years history

- Green Lighting LED practical Technology, editor (2019.9)
- Modern Landscape Lighting Engineering Design, editor (2014)
- Business Tutor of Zheiiang University (2015.6 - present)
- South Taihu Elite Plan leading entrepreneurial team (2020)



**Ju, Chen**

Technical Director

Worked for EZISURG Medical Devices, Siemens Healthineers, and BYD Holdings, worked as Technical Director, Supply Chain Management Director and Purchasing Director.



**Lie, Yao**

Medical Application Manager

Doctor of Fudan University  
Deputy director of Pancreatic Surgery department of HuashanHospital Affiliated to Fudan University

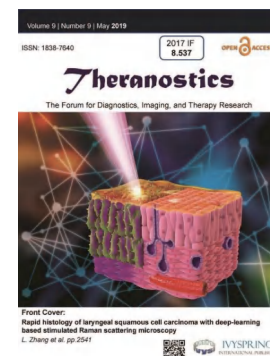
# FuDe

## Publish SCI Papers

- [1] L. Zhang, Y. Wu, B. Zheng, L. Su, Y. Chen, S. Ma, Q. Hu, X. Zou, L. Yao, Y. Yang, L. Chen, Y. Mao, Y. Chen, M. Ji, *Theranostics* 2019, 9, 2541-2554.
- [2] W. Wang, H. Liu, Y. Lu, X. Wang, B. Zhang, S. Cong, Y. Zhao, M. Ji, H. Tao, L. Wei, *International Journal of Nanomedicine* 2019, 14, 875-888.
- [3] R. He, Y. Xu, L. Zhang, S. Ma, X. Wang, D. Ye, M. Ji, *Optica* 2017, 4, 44-47.
- [4] R. He, Z. Liu, Y. Xu, W. Huang, H. Ma, M. Ji, *Opt Lett* 2017, 42, 659-662.



(Journal of Optics I)



(Journal of Medical 1)

## Patent

FuDe has 16 patents, including 2 invention patents

### CN202010335690.1 Patent for Invention

Aspherical Double Lens  
LED Headlight Based on  
Lighting Principle

Ji Minbiao, Wang Wenshuo,  
Ao Jianpeng, Guan Qinyi,  
He Ruoyu, Yao Lie, Ma Jiong

### CN202010335716.2 Patent for Invention

Anaberration Aspheric  
Three-Lens Surgical  
LED Headlight

Ji Minbiao, Wang Wenshuo,  
Ao Jianpeng, Guan Qinyi,  
He Ruoyu, Yao Lie, Ma Jiong

## Award

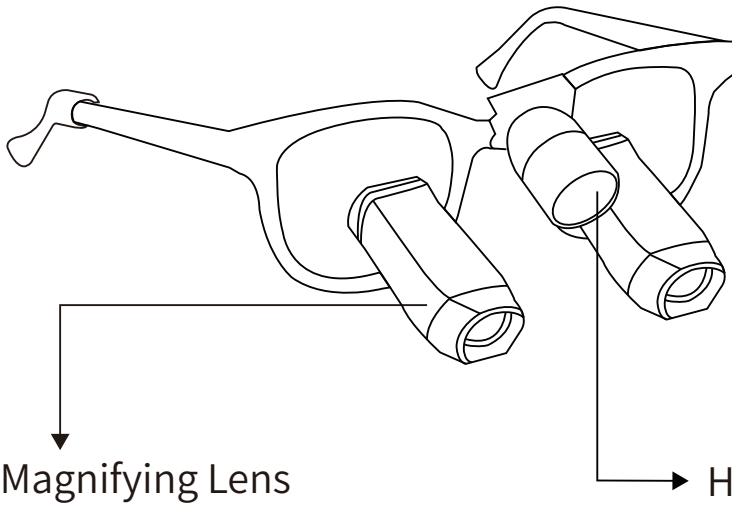
**2020**  
**Zhejiang Huzhou**  
**Nantaihu Elite Plan**  
**Leading**  
**Entrepreneurial**  
**Team Type B**

**2021**  
**Shanghai Free**  
**Trade Zone**  
**Cloud+ Talents**  
**Innovation**  
**Conference TOP10**  
**Yong Enterprise**

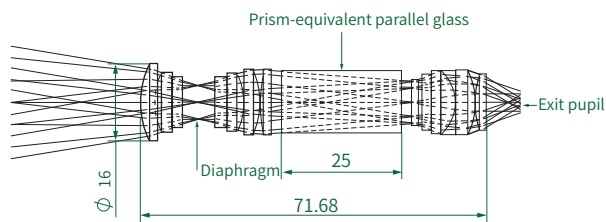
**2022**  
**Zhejiang**  
**Innovation and**  
**Entrepreneurship**  
**Competition**  
**Leading**  
**Entrepreneurial**  
**Team**

Core Technology

# FuDe

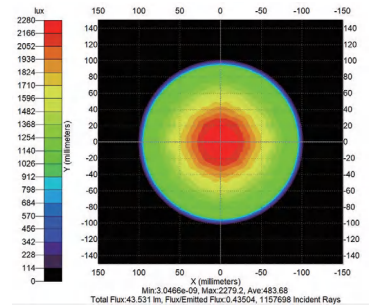
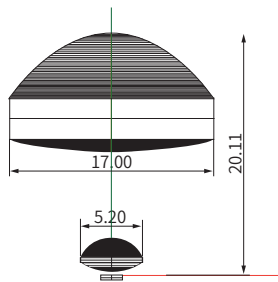
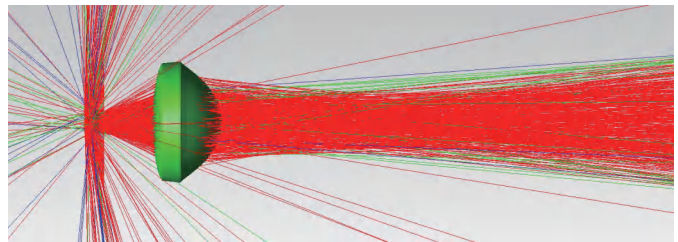


## Kepler's Type

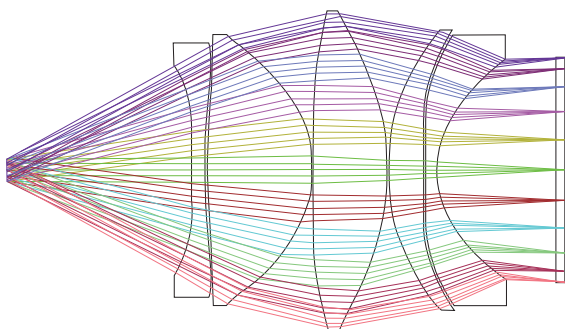


## Aspherical Technology Features

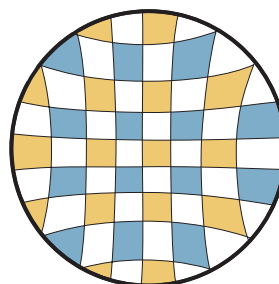
Better lighting quality, better design and technological requirements



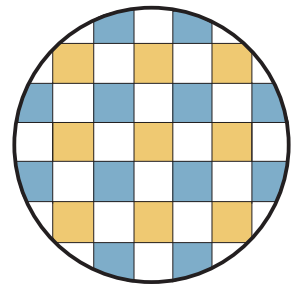
## Aspherical Eyepiece Eliminates Distortion



Spherical Lens



Aspherics Lens



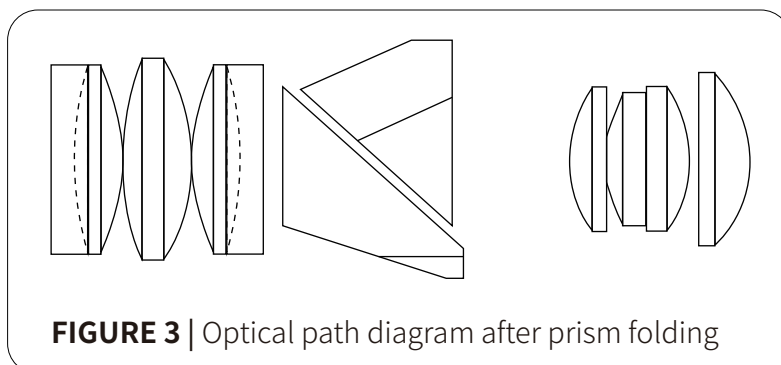
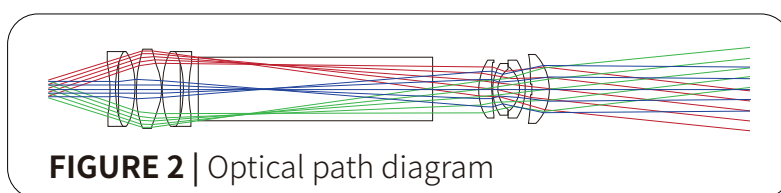
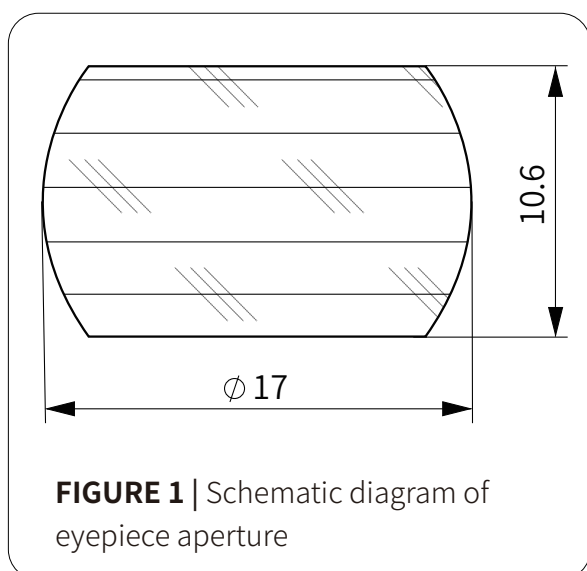
## Kepler Series Aspherical Lens Surgical Binoculars Model Optical path design



The scheme consists of 9 plastic aspherical lenses and image shift prisms. The prism is replaced by parallel flat glass. Aspheric lens materials are OKP-4, ARTON\_FX4726, ARTON\_FX4726, ARTON\_FX4726, OKP-4, APL5014, POLYSTYR, POLYSTYR and APL5014, respectively.

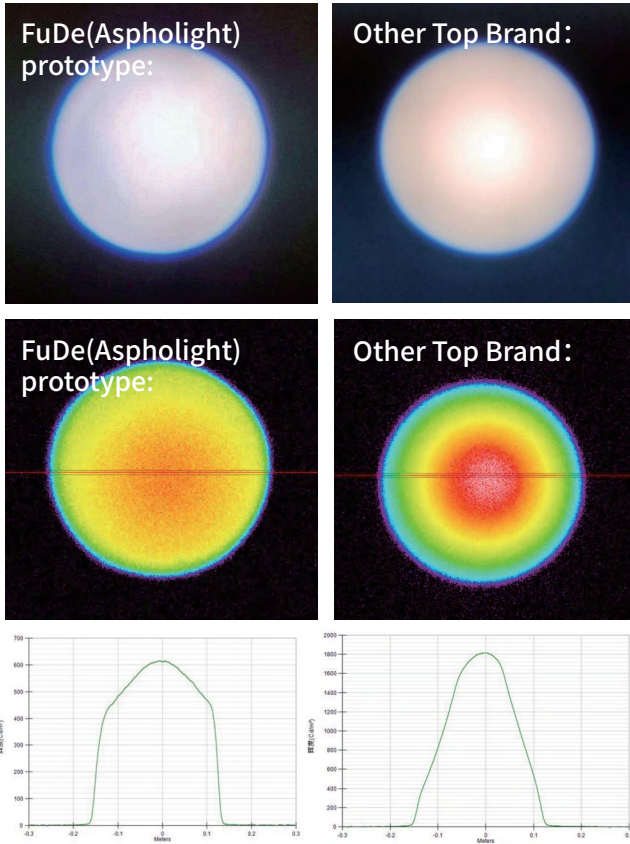
FIG. 3 shows the optical path while using the real prism group. After the optical path is folded, the total length is 53.1mm.

- (1) Eye view:  $+21^\circ$
- (2) Object field of view: when the object distance is 450mm, the covering surface size is 110mm (diagonal direction)
- (3) Magnification: 3X-6X
- (4) Eyepiece caliber:  $< 17\text{mm} \times 10.6\text{mm}$  (effective aperture  $16.4\text{mm} \times 10\text{mm}$ )
- (5) Objective lens caliber: 12.5mm (12.5 is the reference value, the caliber can be adjusted, shall not exceed the eyepiece caliber)
- (6) Total length:  $< 55\text{mm}$

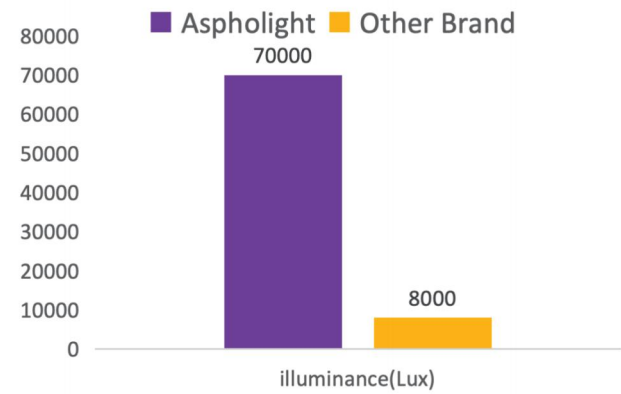
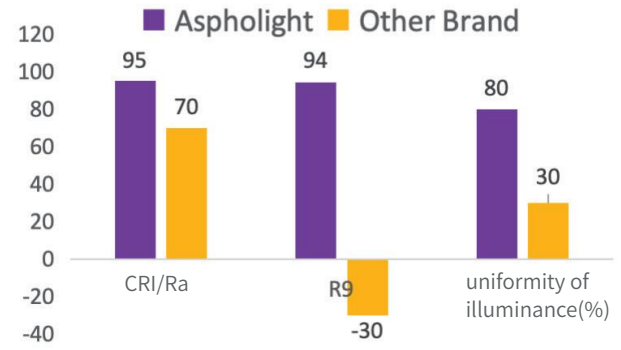


Core Competitiveness

# FuDe



## Comparison of Parameters



Stock Technology and Products

# FuDe

## 4K Camera+Aspholight+Kepler

Record of operation | Teaching demonstration

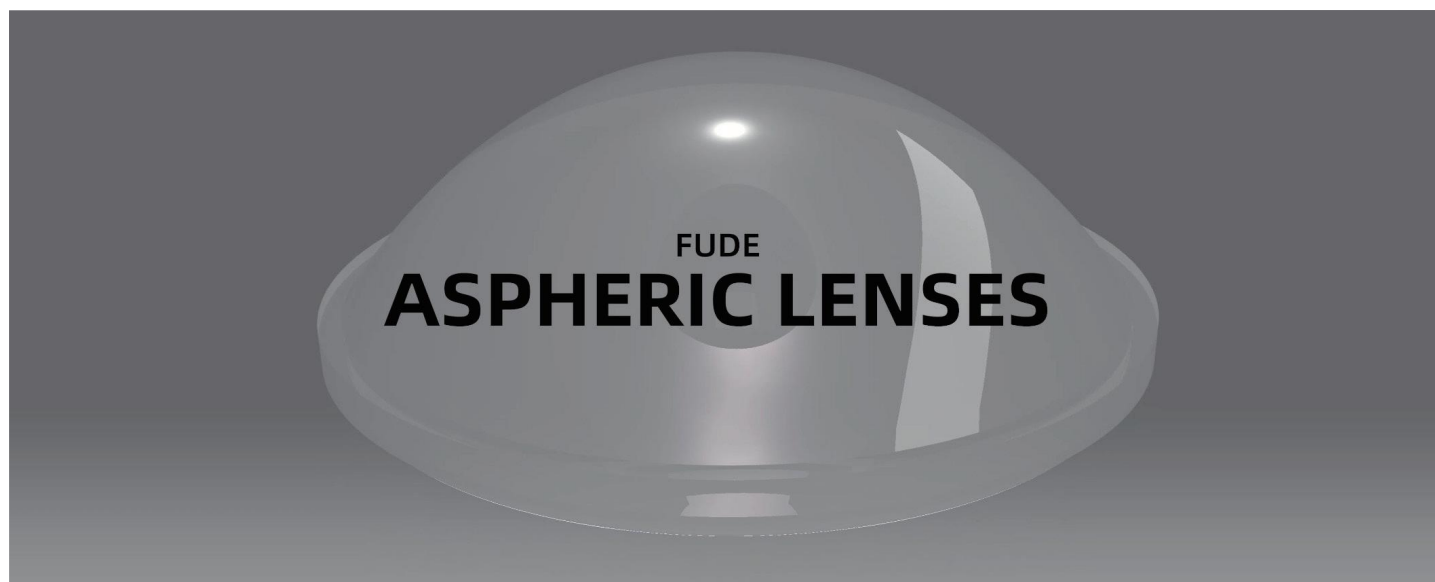
Simultaneous playback | Fluorescent labeling

Pioneering surgical – Fluorescent Labeling of Tumor Cells – Future Biopsy Techniques

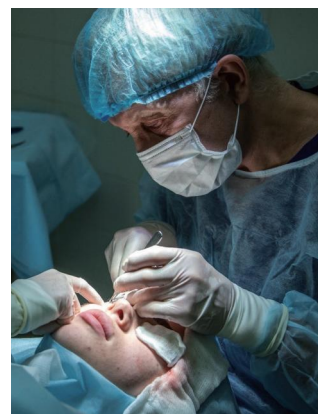
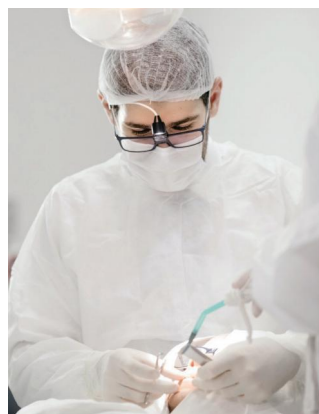


Our Products  
**FuDe**

## Aspholight Series Surgical LED Headlight



## Application

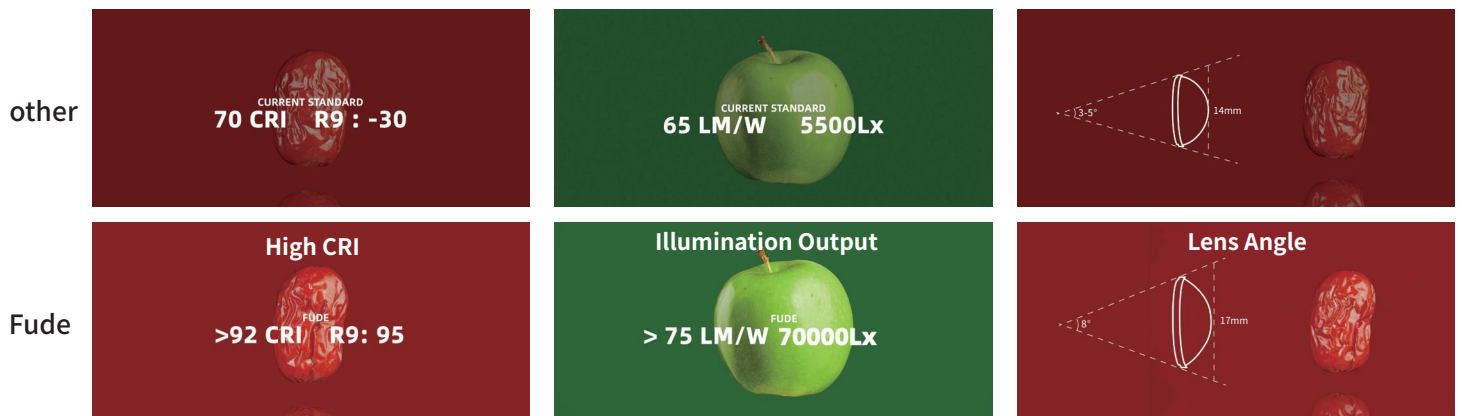


**Cardiac Surgery | General Surgery | Stomatology | Plastic Surgery**  
**Organ Transplantation | Pediatric Surgery | Hepatobiliary Surgery**  
**Burn Surgery | SpineSurgery | Neurosurgery | ENT**

# Product Description

# FuDe

## Comparison of Parameters of FuDe Surgical Headlights



Parameter Comparison	Aspholight Basic (FUDE)	Aspholight Nano (FUDE)	Aspholight Pro (FUDE)	Aspholight Luxe (FUDE)	Foreal F8	Foreal F5
Color rendering index	90	92	95	96	90	90
Uniformity of illuminance	≥80	≥80	≥85	≥85	≥80	≥85
Visual field	B8:Φ17cm@60cm B5:Φ12cm@60cm	N8:Φ17cm@60cm N5:Φ12cm@60cm	P8:Φ17cm@60cm P5:Φ12cm@60cm	L8:Φ17cm@60cm L5:Φ12cm@60cm	Φ17cm@60cm	Φ12cm@40cm
Light Intensity @20cm (+-5%)	45,000lux	55,000lux	70,000lux	80,000lux	40,000lux	45,000lux
Light Intensity @40cm (+-5%)	17,000lux	20,000lux	24,000lux	28,000lux	14,000lux	16,000lux
Colour temperature	6000K	6000K	6000K	6000K	6000K	6000K
Weight (g)	12	17	16	17	15	15
Dimmer	Graded+stepless dimming	Graded+stepless dimming	Graded+stepless dimming	Graded+stepless dimming	Graded+stepless dimming	Graded+stepless dimming

Product Description

# FuDe

## Aspholight Luxe Surgical LED Headlight



reddot winner 2023



80000LUX | CRI:96

17g Net Weight

Sustainable Material

Aviation Coating

Stepless Dimming



reddot winner 2023

## Aspholight LUXE

Product Description

# FuDe

## Aspholight Pro Surgical LED Headlight



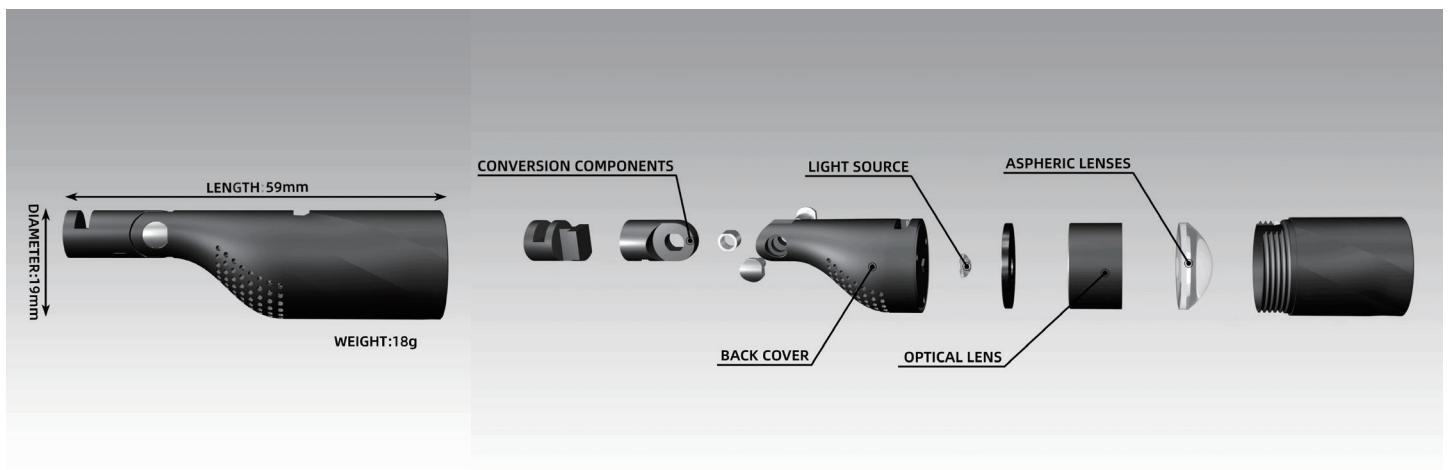
70000LUX | CRI:95

16g Net Weight

Sustainable Material

Aviation Coating

Stepless Dimming



Product Description

# **FuDe**

## **Aspholight Nano Surgical LED Headlight**



55000LUX | CRI:92

17g Net Weight

Sustainable Material

Aviation Coating

Stepless Dimming

## **Aspholight Basic Surgical LED Headlight**



45000LUX | CRI:90

12g Net Weight

Sustainable Material

Aviation Coating

Stepless Dimming

Product Description

# Foreal

## Foreal F5

### Surgical LED Headlight



45000LUX | CRI:90

15g Net Weight

Sustainable Material

Aviation Coating

Stepless Dimming

## Foreal F8

### Surgical LED Headlight



40000LUX | CRI:90

15g Net Weight

Sustainable Material

Aviation Coating

Stepless Dimming

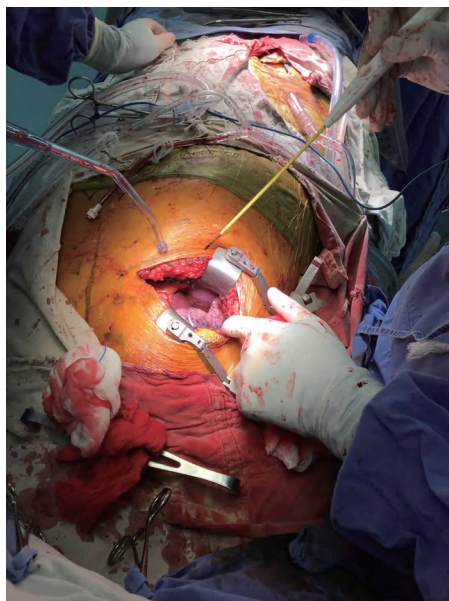
Clinical Application

# FuDe

## Comparison of Clinical Applications of Fude Surgical Headlights

### Surgery Scene

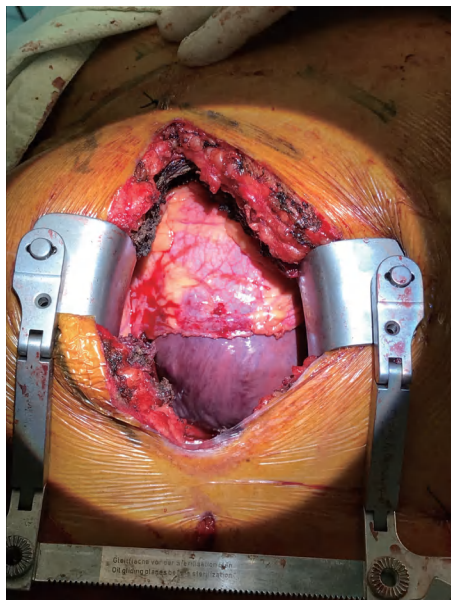
Surgical project: minimally invasive mitral valve forming.  
Location: Department of Cardiac Surgery, Zhongshan Hospital, Fudan University



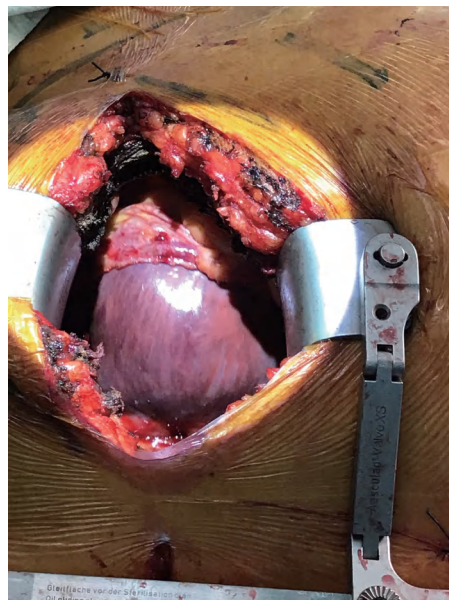
### Lighting Effect Comparison

Experimental results:  
Fude's headlight has a larger irradiation area, stronger irradiation intensity and better color presentation ability.

Fude



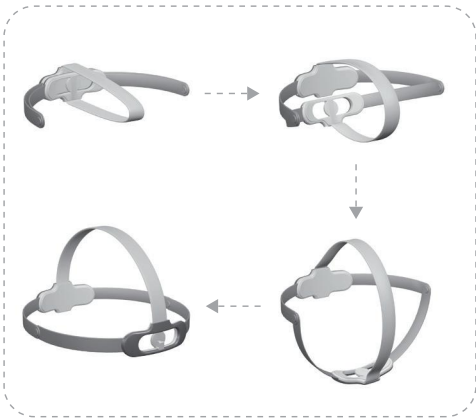
Others



Product Accessories

# FuDe

## Portable Headband



Foldable Storage

Sustainable Material

Ergonomic Design

Proper Weight Distribution

Custom Logo in Three Colors

No fatigue Wearing

## Battery Pack



Power Status

Charge Protection

Discharge Protection

Short Circuit Protection

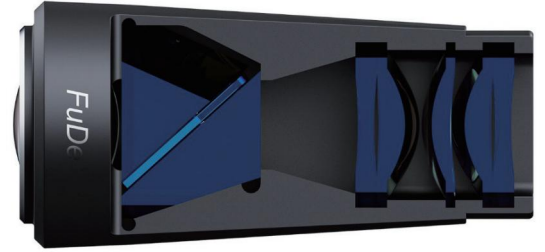
Charge Reminder

Low Power Reminder

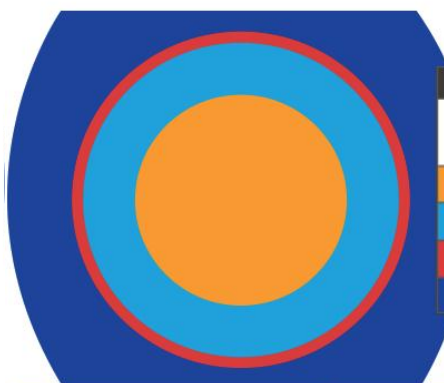
Product Description

# FuDe

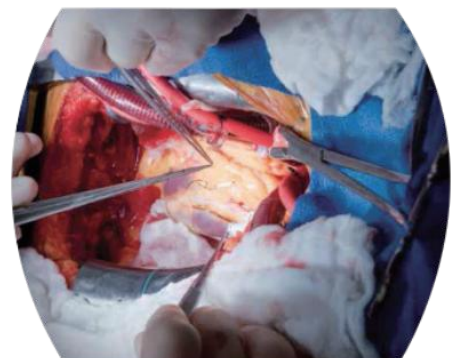
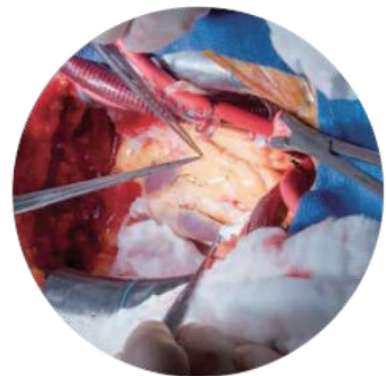
## Kepler Series Aspherical Lens Surgical Binoculars Model



### 3.5X Panorama | 7 Aspheric Lenses Design



3x		
Lens	Visual field area	Visual field diameter
standard	20 cm <sup>2</sup>	5.0cm
wide angle	44 cm <sup>2</sup>	7.5cm
standard wide angle	50 cm <sup>2</sup>	8.0cm
panorama	110 cm <sup>2</sup>	11 x 10 cm



Lens	3X Wide angle	Panoramic 3X wide angle
Visual field area	50 cm <sup>2</sup>	110 cm <sup>2</sup>
Visual field diameter	8 cm	11 x 10 cm
Visual field angle	14°	21°

## Product Description

# FuDe

## Galileo Series Aspherical Lens Surgical Binoculars Model



### Optional frame colors



Matte Black



Silver of dawn



Dark silver



Gold



Performance	Galileo 2.5X	Galileo 3.5X
Visual Field Area	132cm <sup>2</sup>	78cm <sup>2</sup>
Visual Down Angle	12°	12°
Working Distance	40-60cm	40-60cm
Visual Field Angle	13cm	10cm
Weight	42g	42g
Depth of Field	21.5cm	26.3cm

The surgical headlight has two aperture configurations (8 and 5), for use with surgical binoculars;  
To support refractive errors, surgical binoculars are custom-made to provide the user with refraction sheet

Product Description

# Foreal

## Surgical Binoculars



### Optional frame colors

- Matte Black
- Silver of dawn
- Dark silver

### Optical Lens



Performance	Galileo 2.5X
Visual Field Area	110cm <sup>2</sup>
Visual Down Angle	12°
Working Distance	40-60cm
Visual Field Angle	13cm
Weight	42g
Depth of Field	25cm

# Note



***FuDe***

Telephone: + 86 0572-8234203

E-Mail : [info@fudehealthcare.com](mailto:info@fudehealthcare.com)

Website: [www.fudehealthcare.com](http://www.fudehealthcare.com)

Factory address: 298 Qianlong Middle Road, Qianyuan Town, Deqing County, Huzhou City, Zhejiang

Sales company address: Room 204, No. 678 North Shaanxi Road, Jing 'an District, Shanghai