

Magnus – Fraen Partnership

Since its inception in 2000, Fraen Srl has defined the concept of MAXIMIZING LIGHT! and is committed to developing high-quality, innovative and technologically advanced optical solutions to satisfy customer requirements.

Based on its rich knowledge of optical systems, Fraen Srl has developed automotive lighted instrumentation pointers, fiber optic couplers, light pipes, high-efficacy TIR collimators, etc and has become the industry benchmark for the top quality optical solutions for high-powered LEDs.

Magnus has a significant presence in the healthcare & education sectors in the Indian market and its microscopes have been the preferred choice for a number of World Bank funded projects. Since 1995, more than 15,000 Magnus microscopes have been supplied to important World Bank public health programs.

Guided by Japanese production methods and manufactured in a TUV-certified ISO 9001 : 2000 facility, Magnus microscopes are today recognized for their precision engineering and high-performance optics. The core team at Magnus has been specially trained in Japan & Germany by experts from leading optical engineering companies in the world.

The Magnus-Fraen partnership strives to combine the optical design and manufacturing strengths to produce high precision and cost competitive products to serve the education and healthcare markets all over the world.

MicroLED Specifications

Lifetime	: >30,000 hrs
LED Power	: Typically 3W, depending on LED type
Excitation	: See table ▶
Modules available	: Clamp-on modules available for the following microscopes: • Magnus Icon • Magnus MLXi • Olympus CX21 • Olympus CX31
Emission filters	: 2 or 3 positions sliding filter carrier depending on the excitation spectra
Mirror	: Enhanced Al + SiO coating
AC adaptor	: Input Voltage 220/110V AC Output Voltage - 7.5V DC / 12V DC Power - Max. 15 - 18W

LED Cassettes	Excitation
Royal Blue	450nm
Blue	480nm
Green	535nm

Optionals

Battery Pack	: Rechargeable NiMH battery pack for Fluorescence module
Intensity Control	: Fluorescence illumination intensity control through variable potentiometer
Digital Cameras	: Choice of Digital SLR camera or USB/Firewire camera. (Requires Trinocular Head and adapter as per microscope model)



MicroLED

Fluorescence in a new light

Magnus

FRAEN
MAXIMIZING LIGHT

MAGNUS ANALYTICS

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THE NEW VISION OF FLUORESCENCE MICROSCOPY

Overview

Magnus Analytics and Fraen Corporation, Italy bring you an integrated optical solution for fluorescence microscopy consisting of a unique, proprietary illumination system with high power solid-state (LED) sources to replace the mercury and xenon arc-lamps found in traditional epi fluorescence microscopy.

This approach allows significant increase of performance and light source lifetime, reduction of initial costs and operating costs, reduction of maintenance and less heat production.

The module is designed to attach to a number of standard bright field microscope and fluorescence microscopy can be done by simply inserting a mirror in the light path.

Bright field microscopy is not affected since the halogen white light function remains intact. Magnus MicroLED LED fluorescence modules are available for the Olympus CX series and the Magnus Icon as well as MLXi microscopes.

The standard fluorescence module is available with 480nm (blue) module. Other options include the 455nm (deep Blue) and the 535nm (green) LED cassettes.



MicroLED attachment on a Magnus MLXi microscope. The Digital SLR camera with appropriate adapter mounted on a Trinocular head provides high resolution images for archival and sharing. Options are available to attach other cameras for live image view on a laptop

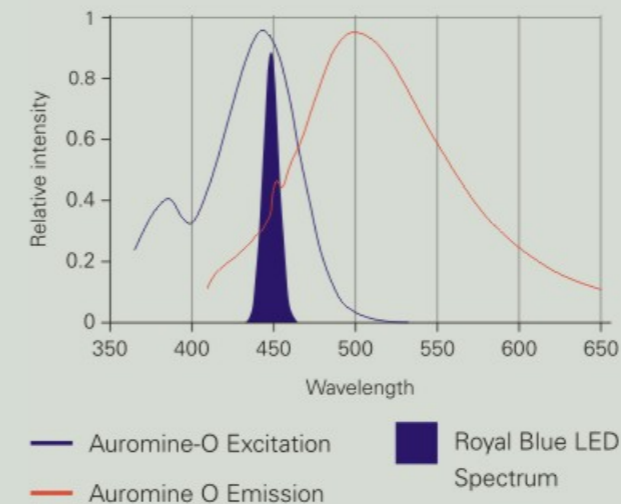
Tuberculosis Application

Transmitted light microscopy on sputum samples is the most widely used method to diagnose pulmonary tuberculosis. However, this method is complex and has low sensitivity compared to culture, while the more-sensitive fluorescence microscopy method is a far more reliable and effective diagnostic tool.

Till now, the fluorescence method has not found favour in public health programmes, due to the high initial investment required for a fluorescence microscope. But now, with MicroLED, fluorescence microscopy can be employed on small microscopes at an affordable price.

Advantages of Fluorescence Microscopy over ZN staining

- Observation at low magnification provides high throughput – Due to the use of 40x magnification in fluorescence instead of 100x, the user can view a much larger field and thus make the process of diagnosis faster.
- The output of the Royal Blue LED (455nm) used for tuberculosis applications provides a perfect match for the excitation peak of the Auramine O Dye, resulting in a high contrast image with excellent Signal-to-Noise ratio

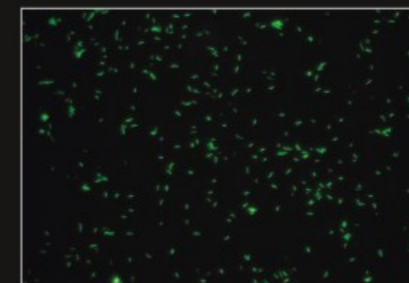


- With the use of a dry 40x objective, there is no need for using oil resulting in overall savings as well as lesser microscope maintenance issues associated with the use of immersion oil.
- The fluorescence method achieves higher sensitivity than the ZN method making detection of TB pathogens easier.

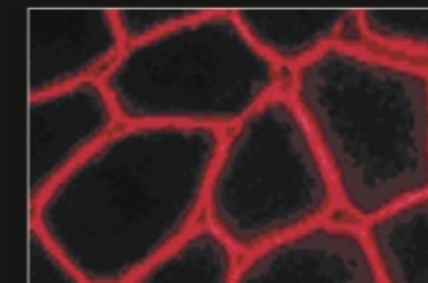
Key Benefits

The MicroLED has been developed to provide equivalent performance and capability delivered in standard fluorescence microscopy equipment, but with a series of enhancements designed to make the technology accessible to more users, easier to operate and maintain, and significantly smaller to make it portable. Some of the key advantages offered by this technology are as under :

- The LED modules are light sources emitting an extremely efficient spectrum only in the desired bandwidth, thus ensuring a very good signal-to-noise ratio.
- Light source lifetime: typically 30,000 hrs, thus allowing many years of operation and cost savings.
- No warm-up time required for the light source.
- No need of any special alignment procedure.
- Variable light control allows adjustment of illumination intensity to reduce photobleaching
- Allows transmitted light observation without removing the fluorescence module
- Choice of Blue, Royal Blue and Green LED cassettes
- Battery pack option for field operation.



The mycobacteria appear as bright luminous rods on a dark background.



Single Colour Excitation Muscle, Alexa Fluor 546.