

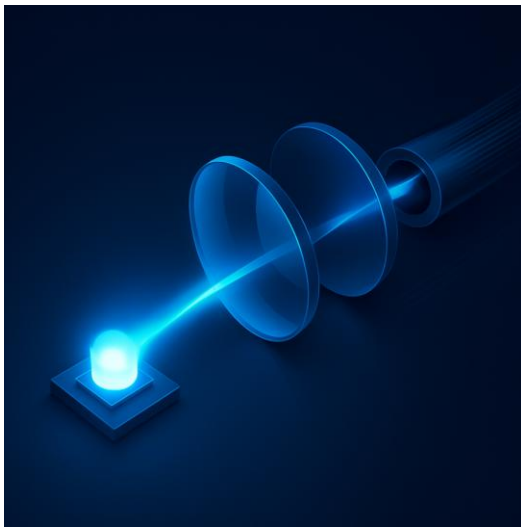
## Case Study: Lightweight Illumination — Redefining Ergonomics in Endoscopic Surgery, Enabled by OptiCore-MX™

### Problem Statement

A leading gynecologist performing long-duration endoscopic surgeries reported that conventional fiber-optic cables—typically with a 4.8 mm inner diameter and an outer diameter of around 10 mm—made the endoscopic setup excessively heavy. At approximately 2.3 meters in length and weighing nearly 400 grams, these cables added significant strain when connected between the light source and the scope. During lengthy procedures, this weight—combined with the attached endoscopic camera—caused surgeon fatigue and limited maneuverability, especially when the assistant had to hold the setup in position for extended periods.

### Our Solution

EPMD addressed this challenge through its OptiCore-MX™ micro-optical platform, a proprietary technology that dramatically enhances optical efficiency and light coupling. By optimizing lumen transfer through ultra-precise micro-optics, our light source delivers exceptional brightness even through a much smaller 3.5 mm inner-diameter fiber cable. This innovation allowed the entire optical interface to be redesigned—reducing the outer diameter to under 7 mm, resulting in a cable that is slimmer, more flexible, and dramatically lighter.



### Advantages of OptiCore-MX™

 Lightweight Design	 High Optical Efficiency	 Reduced Heat	 Superior Color Quality
4.8 kg	Coupling = 93%	$\Delta T < 0,9^{\circ}\text{C}$	CRI = 96

### Impact

The new lightweight fiber-optic cable weighs just over 200 grams—almost half the weight of conventional systems. Surgeons immediately noticed the improvement: reduced wrist fatigue, smoother instrument control, and easier handling throughout lengthy procedures.

The smaller, more flexible cable also simplified storage and setup, creating a more ergonomic and efficient operating-room workflow.

“The difference was immediate — I could hold the scope comfortably through a long surgery without feeling the strain,” shared the surgeon. “The cable felt almost feather-light, and the illumination remained sufficient even at just 50% light intensity.”

EPMD’s OptiCore-MX™ platform transformed a long-standing ergonomic limitation into a breakthrough in comfort and usability — achieving a perfect balance of lightweight design and uncompromised optical performance.