

Annotated References, Updated June 2021

The ArthroFree™ System Page (lazurite.co/arthrofree)

1. The ArthroFree Difference

Internal tests of the Meridiem™ Light Engine (MLE) used in the ArthroFree surgical camera indicate that it requires only 400mW to produce lumen comparable to 300W-light sources. Under heavy use, its heat production is minimal: <60 °C compared to >230 °C in LED-based systems with comparable lumen output.

3M™ indicates that their loban™ 2 Antimicrobial Incise Drapes have a flash point of 121.1° C. Spradling et al. measured the peak temperature of a flexible fiber-optic ureteroscope, connected by fiber-optic cable, to be 194.5° C. Smith and Soham found that fiber-optic light cables can melt polypropylene surgical drapes.

- 3M. "Safety Data Sheet: 3M loban 2 Antimicrobial Incise Drapes 6035, 6040, 6048, 6050, 6051, 6640EU, 6648EU, 6650EU, 6651EU." Document Group: 08-3227-9. Version: 12.02. June 17, 2020. <https://tinyurl.com/d7hny72r>.
- Spradling K, Uribe B, Okhunov Z, Hofmann M, Del Junco M, Hwang C, Gruber C, Youssef R, and Landman J. Evaluation of ignition and burn risk associated with contemporary fiberoptic and distal sensor endoscopic technology. *Journal of Endourology*. 2015;29(9): 1076–82. <https://doi.org/10.1089/end.2015.0048>.
- Smith L, Soham R. Fire/burn risk with electrosurgical devices and endoscopy fiber-optic cables. *American Journal of Otolaryngology*. 2008;29(3): 171–176. <https://doi.org/10.1016/j.amjoto.2007.05.006>.

2. Wireless Medtech for Operating Room Efficacy and Patient Safety

In 2018, the US Food and Drug Administration provided recommendations for reducing surgical fires and patient injuries (tinyurl.com/dvpzkpx4). Statistics on annual healthcare-acquired infections (HAIs) come from the Center for Disease Control (www.cdc.gov/hai/index.html). In recent years, the effort to reduce HAIs has yielded some positive news (www.cdc.gov/hai/data/portal/progress-report.html).

3. ArthroFree and Market Opportunities

See the iData Research 2019 report on domestic arthroscopy market opportunities (tinyurl.com/4fmyasua). See the Research and Markets 2020 report on the international arthroscopy market (tinyurl.com/3zrzpnn4). See the Allied Market Research 2020 report on the global endoscopy market (tinyurl.com/3ce2ye7h).

In a 2020 review, researchers describe how the range of procedures for which surgeons opt for minimally invasive surgery continues to grow. This trend is accelerating at ambulatory surgical centers in particular (tinyurl.com/hh3n4h55; tinyurl.com/rm52ssrb).

- Raucci MG, D'Amora U, Ronca A, Ambrosio L. Injectable functional biomaterials for minimally invasive surgery. *Advanced Healthcare Materials*. 2020;9(13). <https://doi.org/10.1002/adhm.202000349>.

Annotated References, Updated June 2021The MeridiemTM Light Engine page

1. Safety and Value, Hand in Hand

As hospitals look to reduce costs through green initiatives, electricity-powered lighting—which comprises 15% of total energy usage—is a key area of concern. The inefficiency of light sources on surgical towers creates burn risks for patients and operating room personnel. Our tests of the Meridiem Light Engine in the ArthroFree surgical camera indicate that it needs just 400mW to produce lumen comparable to 300W-light sources.

- Shen C, Zhao K, Ge J, Zhou Q. Analysis of building energy consumption in a hospital in the hot summer and cold winter area. *Energy Procedia*. 2019;158. <https://doi.org/10.1016/j.egypro.2019.01.883>.
- Spradling K, Uribe B, Okhunov Z, Hofmann M, Del Junco M, Hwang C, Gruber C, Youssef R, and Landman J. Evaluation of ignition and burn risk associated with contemporary fiberoptic and distal sensor endoscopic technology. *Journal of Endourology*. 2015;29(9): 1076–82. <https://doi.org/10.1089/end.2015.0048>.