



SURGICAL LIGHTS - TORONLIGHT™

The ToronLight™ 1620D double dome LED surgical light delivers bright, color-accurate illumination for operating rooms, hybrid theatres, and procedure suites. Each of its two lightheads carries 72 LEDs and produces up to 150,000 lux at the surgical field for clear sightlines into deep cavities. The dual-dome layout positions two independent light fields over the patient, reducing shadows from hands, instruments, and the surgeon's head. Surgical teams rely on this setup for general, orthopedic, and other procedures that need steady light across a wide area.

Built around a fully enclosed, flat dome, the ToronLight™ 1620D suits modern operating rooms with laminar airflow and frequent disinfection. The smooth, streamlined housing has no exposed fasteners or recesses, so cleaning stays quick and the unit works with cleanroom ventilation. An LED source holds the heat-to-light ratio below 3.6 mW/m²·lux, keeping the field cool during long cases and reducing tissue drying. A rated LED life beyond 50,000 hours supports years of routine use with little maintenance.

Color temperature spans 3,500 to 5,000 K and the color rendering index reaches Ra 85 to 95, so tissue and blood read in natural tones. The 90% shadowless rate and depth of illumination above 1,400 mm keep the operative site lit as the work area shifts. A focusable light spot from 150 to 260 mm lets staff match the lit field to each procedure. Torontech supplies the ToronLight™ 1620D to North American hospitals and surgical centers seeking dependable operating-room lighting.

APPLICATIONS

Applications

The ToronLight™ 1620D supports a broad range of surgical and procedural settings where bright, low-shadow lighting affects visibility and accuracy.

- General and Abdominal Surgery: lights deep abdominal and pelvic cavities where a single beam would be blocked by the surgeon's head and hands

- Orthopedic and Trauma Procedures: delivers high intensity for bone, joint, and fixation work that needs clear contrast between tissue types
- Obstetrics and Gynecology: provides even, color-accurate light for cesarean sections and other OB/GYN procedures
- ENT and Plastic Surgery: combines a focusable light field with strong color rendering for fine work on small, detailed sites
- Emergency and Minor Procedure Rooms: gives trauma bays and minor-procedure suites operating-room-grade lighting in a ceiling-mounted form
- Hybrid Operating Theatres: pairs with laminar-airflow ceilings and imaging equipment in modern integrated ORs
- Day-Surgery and Ambulatory Centers: supplies reliable, low-heat lighting for high-throughput outpatient procedure rooms

Standards

Surgical luminaires are classified as medical electrical equipment rather than general lighting, so the ToronLight™ 1620D is designed to align with the international standards that govern operating-room lighting. The applicable standards for this device class include the following.

- IEC 60601-2-41 - Medical electrical equipment, Part 2-41: Particular requirements for the basic safety and essential performance of surgical luminaires and luminaires for diagnosis
- IEC 60601-1 - Medical electrical equipment, Part 1: General requirements for basic safety and essential performance
- IEC 60601-1-2 - Medical electrical equipment, Part 1-2: General requirements for basic safety and essential performance, Collateral standard: Electromagnetic disturbances, requirements and tests
- ISO 13485 - Medical devices: Quality management systems, Requirements for regulatory purposes

FEATURES

Key Features

- The ToronLight™ 1620D pairs strong optical performance with a design built for the realities of an operating room.
- Dual Lighthead Configuration: two independently positioned domes light the surgical field from different angles, cutting the shadows a single head leaves behind
- High Illumination Intensity: each lighthead reaches 60,000 to 150,000 lux, giving surgeons bright, even light deep inside the operative site
- 90% Shadowless Performance: the multi-LED layout dilutes shadows from hands and instruments so the wound stays visible during fine work
- Deep Illumination Zone: usable light extends beyond 1,400 mm of depth, keeping cavities lit as the surgeon changes working height
- Accurate Color Rendering: an Ra of 85 to 95 reproduces tissue and blood in natural tones for confident visual assessment
- Neutral Color Temperature: a 3,500 to 5,000 K white resembles daylight and reduces eye fatigue over long procedures
- Cool LED Light Source: a heat-to-light ratio below 3.6 mW/m²·lux keeps the field comfortable and limits tissue drying compared with halogen lamps
- Adjustable Light Field: a focusable spot from 150 to 260 mm lets the team match the lit area to the procedure
- Long LED Service Life: rated beyond 50,000 hours, the light sources run for years with minimal replacement and downtime
- Sealed, Easy-Clean Dome: a fully enclosed, flat housing with no exposed fasteners speeds disinfection and suits laminar-airflow operating rooms
- Balance-Arm Suspension: a multi-joint ceiling arm holds each lighthead in place and lets staff reposition it with a light touch

Theory and Method

Operating-room lighting solves a specific optical problem: a surgeon, an assistant, and their instruments constantly block light on its way to the wound. A single point source casts a hard shadow, so surgical luminaires spread many small emitters across a wide dome. Light then reaches the surgical cavity from many angles at once. When a hand or head blocks some beams, light from the remaining emitters fills the gap and dilutes the shadow. Engineers call this metric shadow dilution, and the ToronLight™ 1620D reports a 90% shadowless rate from its 72-LED domes.

Depth of illumination describes the vertical zone, above and below the focal point, where brightness stays at or above 60% of the central value. A deep zone matters because the operative site sits at the bottom of a cavity rather than on a flat surface. The ToronLight™ 1620D holds usable light beyond 1,400 mm of depth, so the field stays bright as the surgeon works at different levels. Two domes add a second benefit: the team aims each lighthead from a different angle, which softens shadows further and lets the fields cover separate areas.

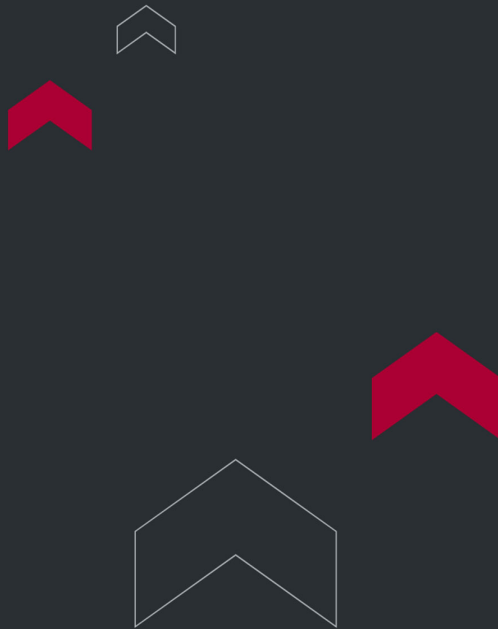
Color accuracy guides clinical decisions, since surgeons read tissue health and blood by subtle shifts in hue. The color rendering index (Ra) measures how faithfully a light reproduces real colors against a daylight reference, and the ToronLight™ 1620D rates Ra 85 to 95. Its 3,500 to 5,000 K color temperature gives a neutral-to-cool white close to daylight, without the blue cast of very high temperatures. LEDs emit almost no infrared, so the heat-to-light ratio stays below 3.6 mW/m²·lux and the beam lights the field without warming tissue the way older halogen lamps did.

TECHNICAL SPECIFICATIONS

Technical Specifications

Parameter	Specification
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Configuration	Double lighthouse (dual dome), ceiling-mounted
Illumination Intensity (per lighthouse)	60,000 to 150,000 lux
Color Temperature	3,500 to 5,000 K
Color Rendering Index (Ra)	85 to 95
Heat-to-Light Ratio	< 3.6 mW/m ² ·lux
Light Spot Diameter	150 to 260 mm
Depth of Illumination	> 1,400 mm
Shadowless Rate	90%
LED Quantity (per lighthouse)	72
LED Service Life	> 50,000 hours



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