Q-FLOW™

Let's be clear about surgical lights.

OPERATING ROOM

DAY SURGERY

A new era in surgical lights.

MERIVAARA

WAARDENBURG MEDICAL

Superior lights for superior surgery – the new Merivaara Q-Flow™

Merivaara Q-Flow™ is the intelligent solution for any operating theatre. The design is optimised for an OR's air flow, improving air flow circulation in the operating area and reducing the potential for contamination. In addition, the Dynamic Obstacle Compensation (DOC™) of Q-Flow™ automatically adapts to the shadows in the light field. Furthermore, Intuitive Sterile Surgeon Control (Intueri™) makes surgical operations safer and more ergonomic for surgeons. The user interface design is simplicity itself – anyone can use it.

Q-Flow™ colour rendering is excellent and the R9 value is the best in its class (R9 99).
As well as all the superb features mentioned, Q-Flow™ has excellent illumination properties, providing a deep column of light – not forgetting green ambilite, delivering consistent light for seeing images and reading monitors.
Designed and manufactured in Finland, the award-winning Q-Flow™ is the light of choice for any surgical team.

Benefits

SURGEON

INTUITIVE AND EASY TO USE

- Provides first class definition of tissues and blood vessels with the best R9 colour rendering and Ra colour definition in combination with 4K camera technology
- Dynamic Obstacle Compensation (DOC™) provides superb light in all circumstances, even if a light beam is temporarily obstructed
- Intuitive Sterile Surgeon Control (Intueri™) gives optimal control without having to use complex buttons
- Less eye stress thanks to green ambilite

HEALTH CARE STAFF

COMFORTABLE AND CONVENIENT

- Intuitive user interface
- Seamless control of light and camera through a touch screen interface
- Lightweight and easy to manoeuvre

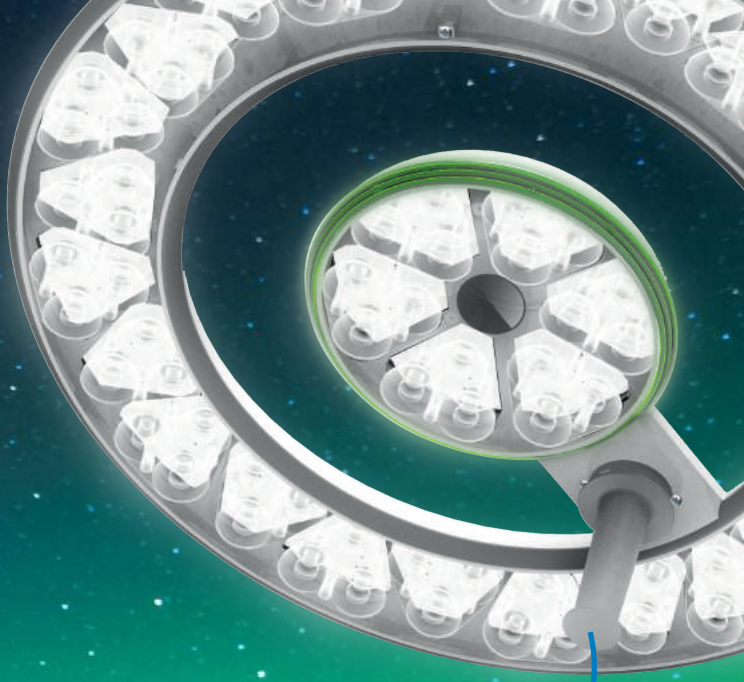
CLINIC

COST-EFFICIENT AND SAFE

- Designed, tested and optimised to make an ultra clean, ventilated environment
- Helps to reduce the patient's clinical risk
- Advanced touch screen controls all settings, intelligent features and surgical camera
- Can also be controlled with OpenOR™ theatre management system and Merimote™
- Always "HD camera ready"

Features

- Optimised for an OR's air flow (Q-OptiFlow™)
- Dynamic Obstacle Compensation (DOC™)
- Intuitive Sterile Surgeon Control (Intueri™)
- Excellent colour rendering
- Green ambilite
- Intuitive User Interface
- Deep column of light



Intuitive Sterile Surgeon Control (Intueri™)

Intuitive Sterile Surgeon Control (Intueri™) is Merivaara's latest patent pending innovation, which allows the surgeon to adjust the light's brightness and diameter without looking up. This provides a constant and clear vision for the surgeon. The interface will automatically appear around the operating area when the user grasps the sterile handle. Disposable handle system also available.

Unique

TURBULENCE INTENSITY 15,9%

Decreased microbial load at the operating area

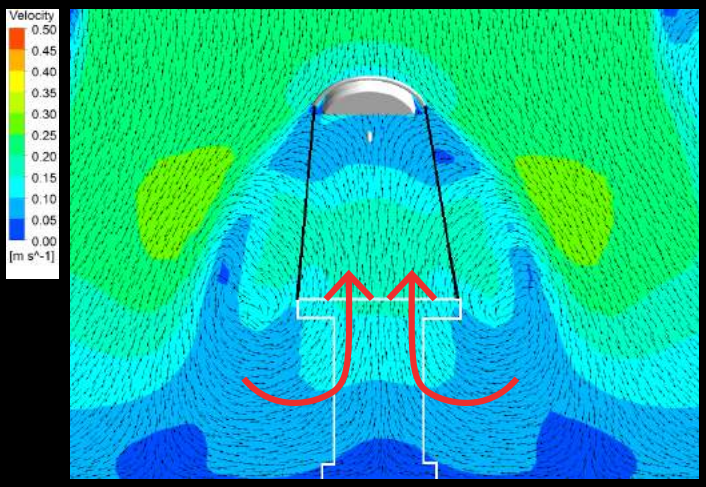
Design optimised for air flow (Q-OptiFlow™)

Hospital associated infections (HAIs) are a highly recognized challenge in hospitals around the world. HAIs increase morbidity, mortality and length of hospital stay, adding to health care costs. More than 4 million patients in Europe and approximately 1.7 million in the US are affected annually. The prevalence of HAIs in Europe is around 7.1 %.

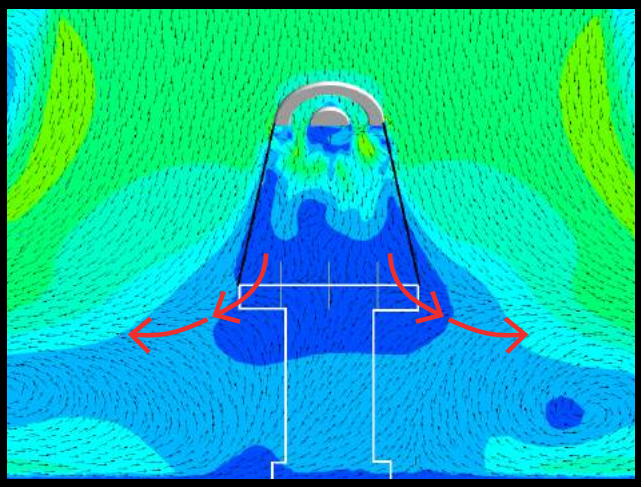
One cause of contamination is uncontrolled air flow in operating theatres. Q-Flow™ is designed for an optimised air flow that allows ventilation to work properly in an operating theatre. Traditional surgical light heads cause air to rise in the operating area, resulting in increased particle content and an increased infection burden for the patient. Due to the optimally designed Q-Flow™, with a turbulence intensity of only 15.9 %, there is no additional particle burden created in the operating area. In addition, this also improves the working conditions for the surgical team, as it helps to keep the area clean from harmful smoke and gases.

See the air flow behaviour of Q-Flow™ in smoke tests.

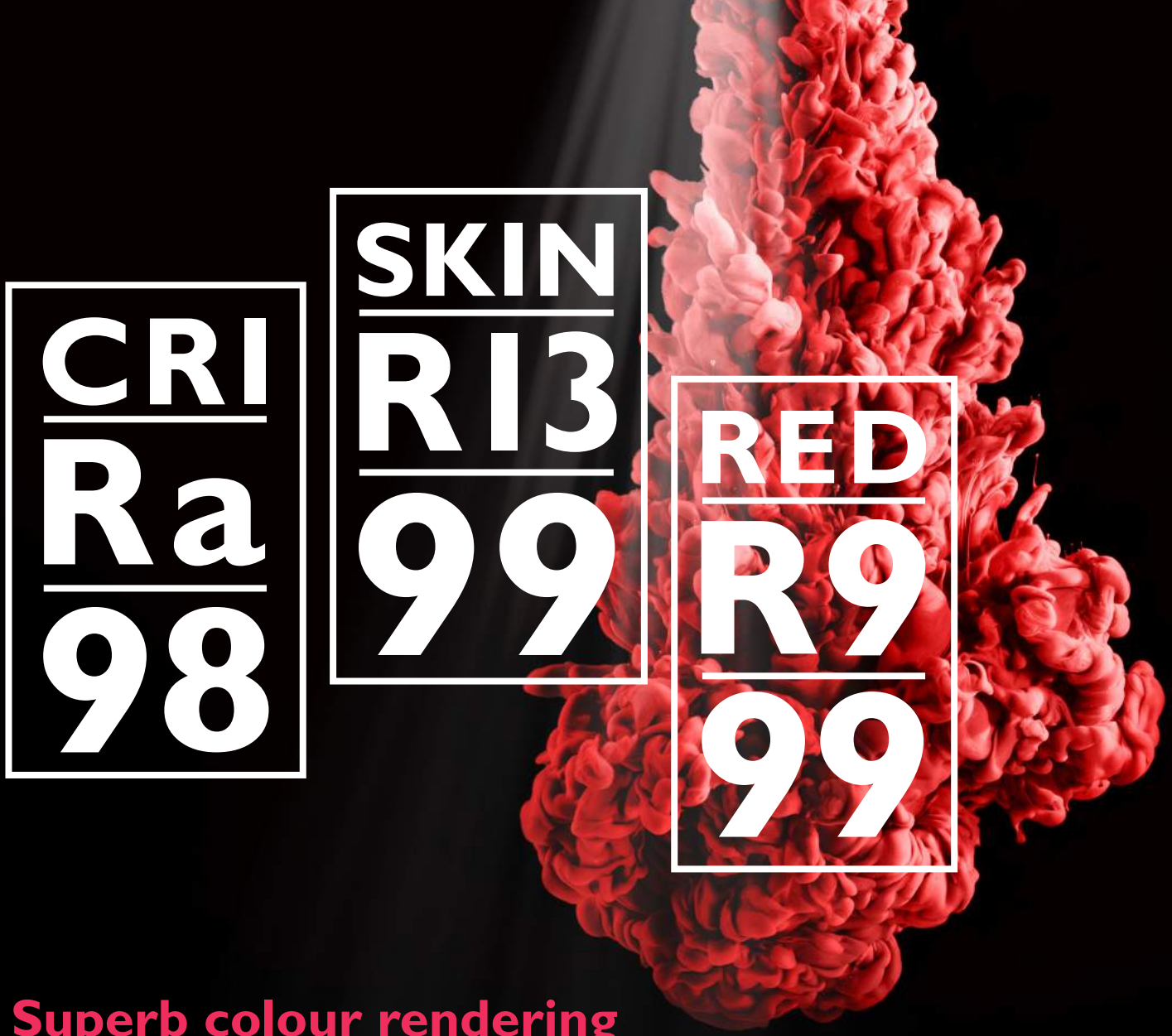
CONVENTIONAL DESIGN



OPTIMISED AIR FLOW DESIGN – Q-FLOW™



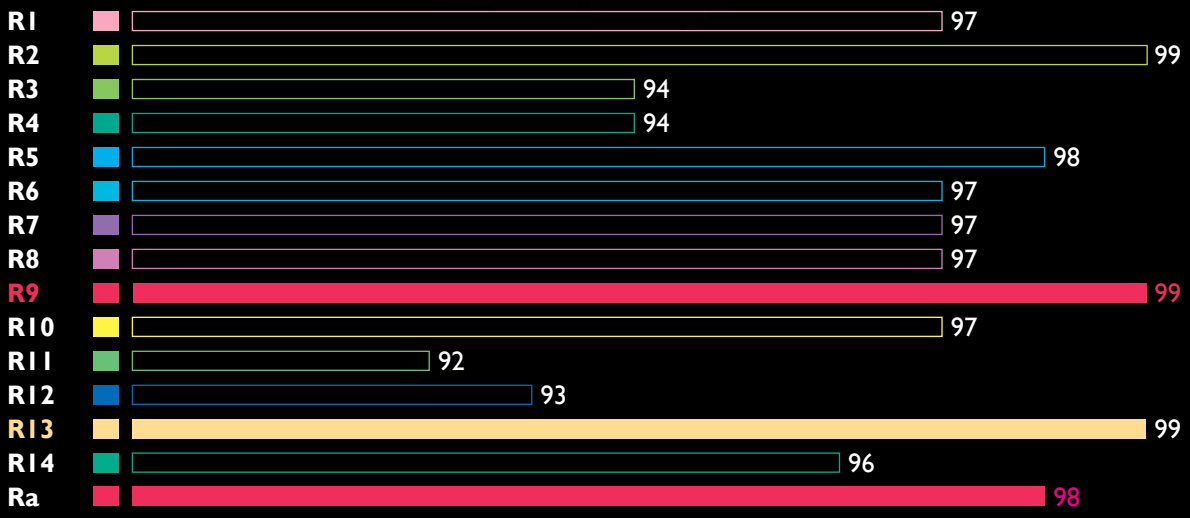
Simulations from a laminar air flow theatre show that the conventional design (on the left) creates a rising air flow which increases the risk of infection. The standard turbulence intensity should be below 37.5 % and the Q-Flow™ boasts an outstanding 15.9 % according to the DIN 1946-4:2008 standard. Thus Q-Flow™ helps to reduce the microbial load around the patient.
DIN 1946-4:2008 standard defines special requirements for the ventilation in buildings and rooms of healthcare.



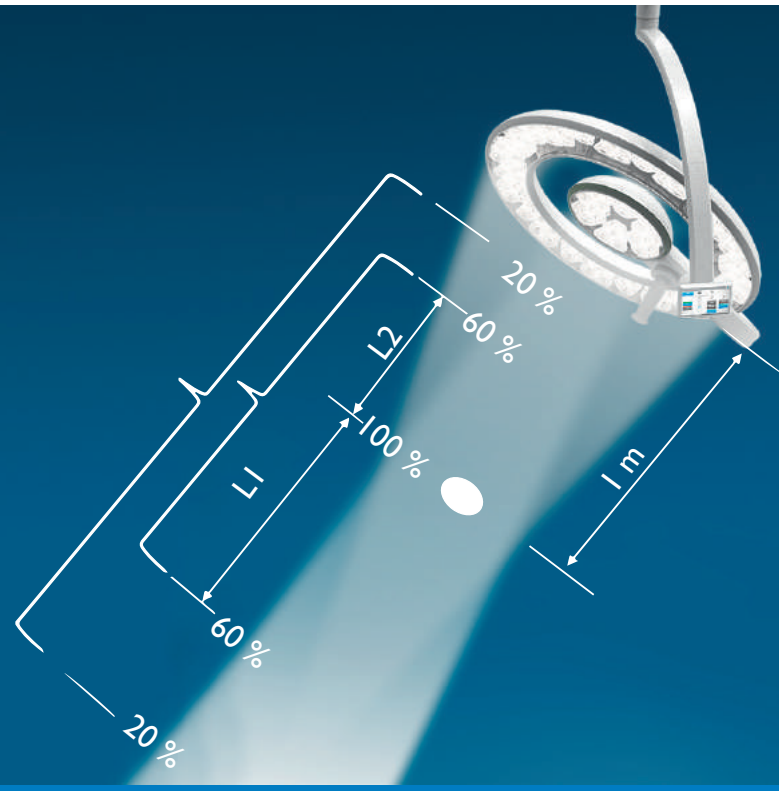
Superb colour rendering

The colour rendering of Q-Flow™ is outstanding. The R9 value is the best in its class R9 99, which means a perfect value of red rendering and therefore a better definition of tissues and blood vessels for the surgeon. The R13 value 99 is also excellent, which is particularly important for plastic surgery and accurate skin colour.

Test Colours Used In Calculating CRI



Deep column of light & Green ambilite



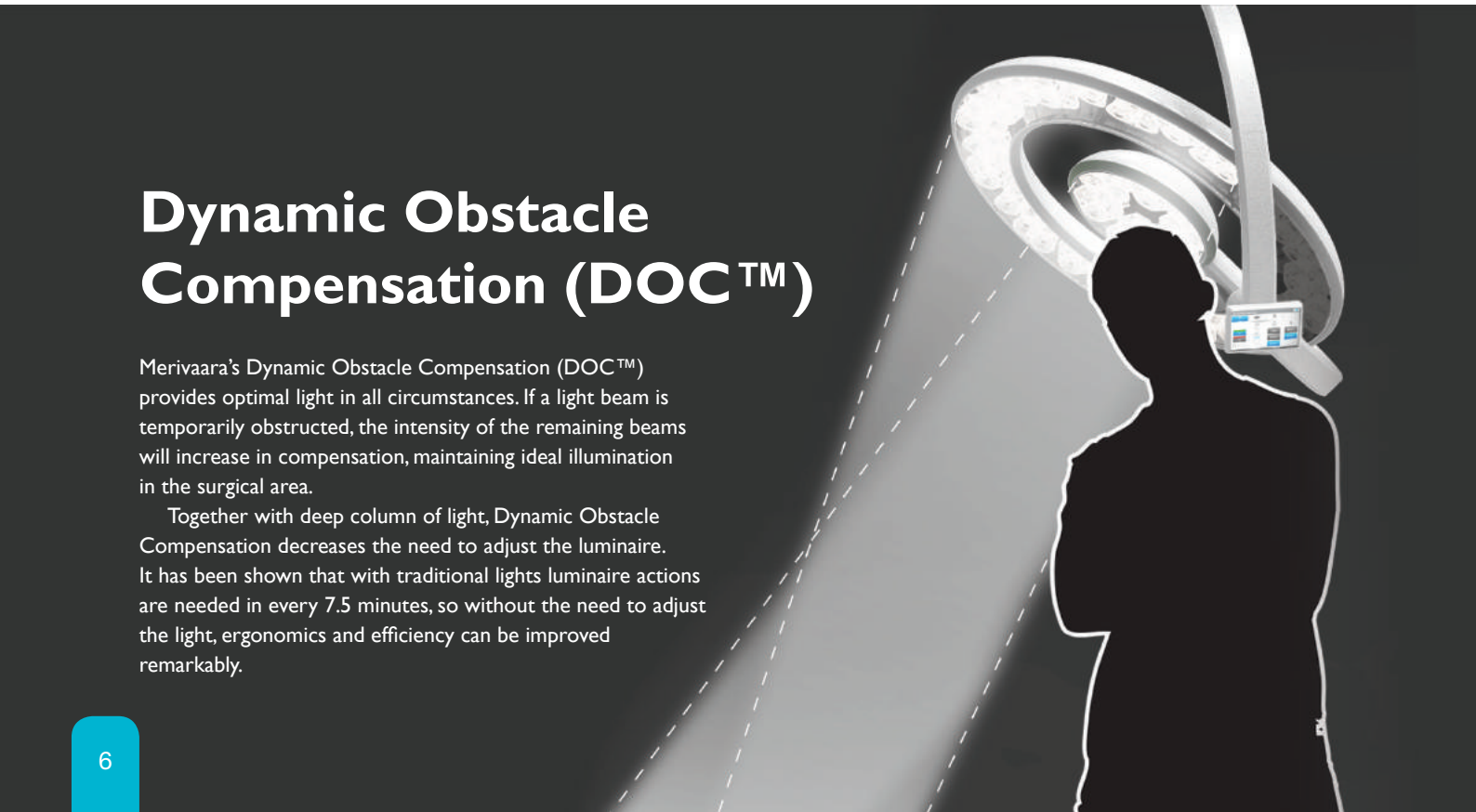
Deep column of light decreases the need to adjust the light and thus improves efficiency in operating theatres. Depth of illumination L1+L2 at 60 % is 750 mm (Q-Flow 6) and 700 mm (Q-Flow 4). At 20 % the value is 1700 mm (Q-Flow 6) and 1400 mm (Q-Flow 4).

Green ambilite provides a consistent light for seeing images and reading monitors in endoscopic procedures.
Due to the Purkinje effect it provides better definition to images and text.

Dynamic Obstacle Compensation (DOC™)

Merivaara's Dynamic Obstacle Compensation (DOC™) provides optimal light in all circumstances. If a light beam is temporarily obstructed, the intensity of the remaining beams will increase in compensation, maintaining ideal illumination in the surgical area.

Together with deep column of light, Dynamic Obstacle Compensation decreases the need to adjust the luminaire. It has been shown that with traditional lights luminaire actions are needed in every 7.5 minutes, so without the need to adjust the light, ergonomics and efficiency can be improved remarkably.



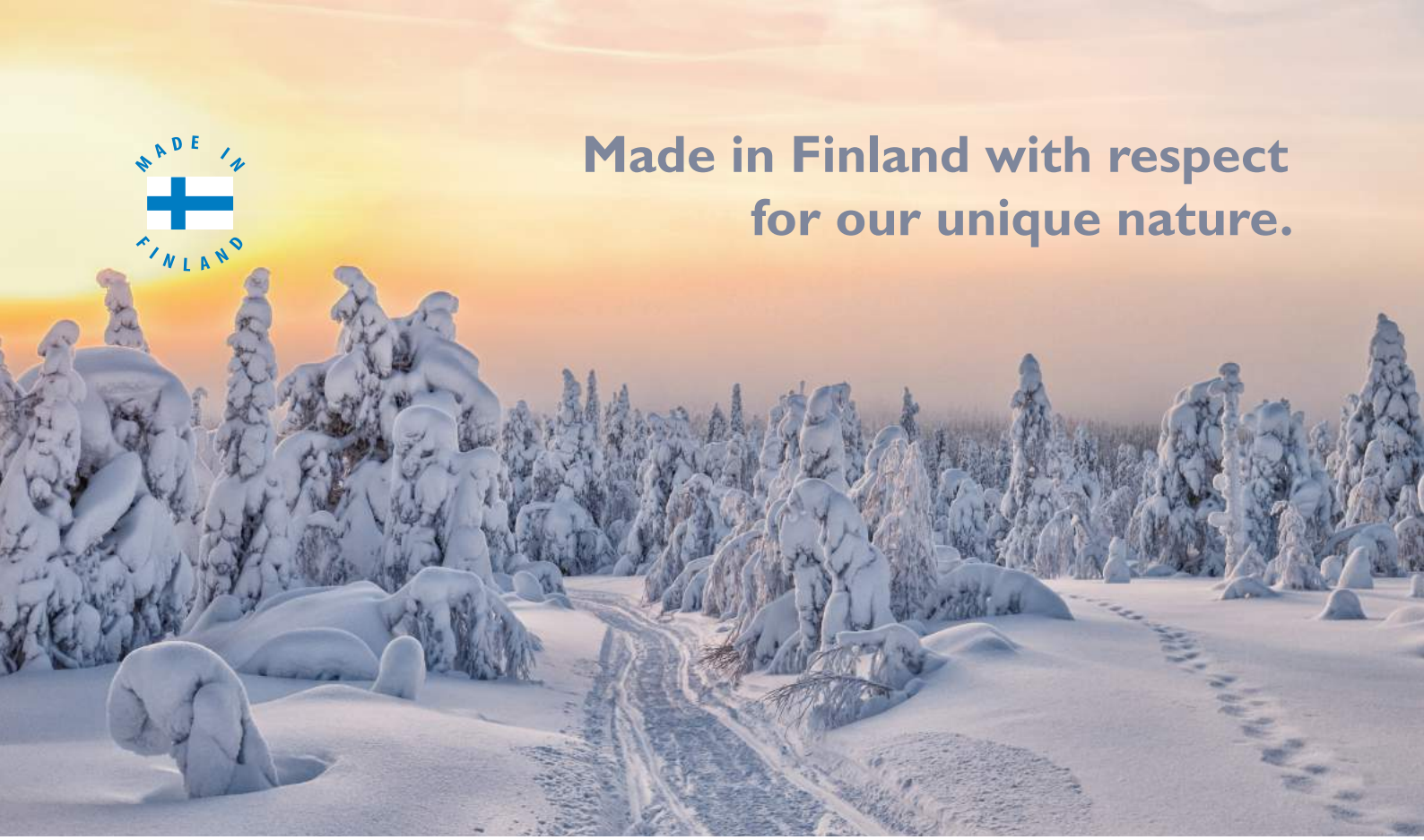
Intuitive User Interface (UI)

The intuitive user interface of Q-Flow™ helps the user to control the light and camera(s). Similar user interface is applied also in other control devices such as Merimote™ and the integration system OpenOR™, and is thus easy for the staff to adapt.

Technical Specifications

	Q-Flow™ 6i	Q-Flow™ 6	Q-Flow™ 4i	Q-Flow™ 4
Max illumination @ 1.0 m	160 klux	160 klux	140 klux	140 klux
Colour rendering index (Ra)	98	98	98	98
Red colour rendering index (R9)	99	99	99	99
"Skin colour" rendering index (R13)	99	99	99	99
Turbulence intensity, DIN 1946	15.9 %	15.9 %	<35 %	<35 %
Variable colour temperatures	3800 / 4500 K	3800 / 4500 K	3800 / 4500 K	3800 / 4500 K
Depth of illumination (L1+L2) @ 60 %	750 mm	750 mm	700 mm	700 mm
Depth of illumination (L1+L2) @ 20 %	1700 mm	1700 mm	1400 mm	1400 mm
Light field diameter	200–380 mm	200–380 mm	200–340 mm	200–340 mm
Integrated dimming	10–100 %	10–100 %	10–100 %	10–100 %
Number of LEDs	90	90	69	69
External dimensions (diameter)	700 mm	700 mm	560 mm	560 mm
Weight of luminaire	16 kg	16 kg	13 kg	13 kg
Green ambilite	✓	✓	✓	✓
Touch panel control	✓	✓	✓	✓
OpenOR™ compatible	✓	✓	✓	✓
MeriMote™ compatible	✓	✓	✓	✓
Integrated camera control (touch screen)	✓	✓	✓	✓
Wireless full HD camera readiness	✓	✓	✓	✓
Full HD camera (1080p60)	O	O	O	O
4K camera system (3840x2160p30)	O	O	O	O
Intuitive Sterile Surgeon Control (Intueri™)	✓	-	✓	-
Dynamic Obstacle Compensation (DOC™)	✓	-	✓	-
Disposable sterile handle system	O	O	O	O
Battery backup	O	O	O	O
Operating time with 27 Ah / 24 VDC battery	2 h	2 h	3 h	3 h

✓ = included O = optional



reddot award 2017
winner

FENNIAprize 17

GRAND PRIX

The Fennia Prize is Finland's most notable design competition where companies and organizations are awarded for the exemplary use of design in their solutions.

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