Focusing on sustainable anesthesia care for a resilient tomorrow

Carestation™ 750 Anesthesia Delivery System

GE HealthCare

Creating a more sustainable future requires us to care for the planet and its inhabitants

It is essential that we continue to drive progress toward early, precise, and accessible diagnosis and treatment of more patients. For the planet, it is critical that we do so with a reduced impact on precious and rare resources that are imperative to life. We believe that the advancement of precision medicine, greater digitization of healthcare, and increased access to quality care are fundamental to accomplishing this goal.

We support carbon policies that reduce greenhouse gas emissions and promote sustainable development. GE HealthCare is committed to achieving net zero by 2050, and we have signed up to the Science Based Targets initiative (SBTi) business ambition for 1.5C, a group of visionary corporate leaders taking ambitious climate action, and we have committed to implementing science based targets. This includes a public goal to reduce operational emissions (scope 1 and 2) by 50% by 2030 against a 2019 baseline. As a result of these efforts, we want to enable a more sustainable health system by addressing not only the environmental impacts of our products, but also the challenges healthcare professionals and their patients face with resilient, digital solutions.

We are committed to achieving net zero emissions by 2050.

We've set a public goal to reduce operational emissions (scope 1 and 2) by 50% by 2030.

Leading a new era in sustainability for a more resilient tomorrow

We're creating a world where healthcare has no limits, helping to improve access to care and enable better patient outcomes.

Environmental
Using fewer resources for a healthier planet.

Digital
Transforming healthcare through innovation.

Resilience
Building flexibility and dependability across healthcare systems.

Carestation 750 anesthesia machine helps create a more sustainable tomorrow

Our Carestation 750 Anesthesia Delivery System and its services help ensure clinicians and the patients they serve have the technology necessary to create a more sustainable and resilient tomorrow.

Reducing environmental impact

- Minimize greenhouse gas emissions from agent waste, encourage green, low-flow anesthesia practices, and track anesthetic agent usage and cost.

- In one study, Carestation 750 with ecoFLOW software has shown to reduce volatile agent utilization by 30%,[1] correspondingly reducing greenhouse gas emissions.*

- Implementation of renewable energy and reduction of electricity used in manufacturing operations.

Improving care

- Helps prevent post-operative pulmonary complications (PPCs) with lung protective ventilation (LPV) tools.[2,3]

- In a clinical trial, Entropy™ (EEG & FEMG signal) Monitoring has been associated with a 30% reduction in Sevoflurane/Isoflurane usage[4] and a 15% reduction in Propofol.[5]

*Actual reduction of greenhouse emissions will be dependent on ecoFLOW suggested clinical practice and volatile agent used.

Contributing to a healthier planet

More than half of the healthcare sector's climate footprint, approximately 53%, is attributable to energy use.[6] As a result, we have strengthened our commitment to environmentally conscious design, and we are implementing more sustainable practices across our product manufacturing, sourcing, distribution, installation, and service operations. This includes improving energy efficiency, optimizing the use of limited or rare materials, providing digitally enabled service throughout the product lifespan, and offering refurbishment and recycling options at the end of product life.

GE HealthCare environmental management system is ISO 14001 certified	Our production and service operations align to ISO 14001 standards.[7]
We're committed to environmental product design	This product conforms with IEC60601-1-9:2013.[8]

Materials

GE HealthCare reviews the environmental aspects of the material supply used within our products to increase recyclability and decrease the use of hazardous substances, when possible.

Recyclability	We are committed to increasing recyclability according to Waste Electrical and Electronic Equipment regulations and to reducing use of hazardous substances in manufacturing, when possible.
	Carestation 750 materials are recycled according to the product WEEE passport[9] • Ferrous Metal: 23% • Non-ferrous Metal: 54% • Plastic: 15% • Other (incl. electric components): 8%
	Greater than 80% of the Carestation 750 packaging materials are recyclable materials.[10]
Reduce the use of hazardous substances	EU RoHS directive 2011/65/EU.[11]
	REACH (EC) 1907–2006.[12]

Packaging

GE HealthCare anesthesia delivery systems have a robust and multi-sourced supply chain for systems and spare parts across our product portfolios.

Product packaging

Carestation 750 packaging material utilized in the Madison, WI USA site consists of the following materials (% per weight):[7]
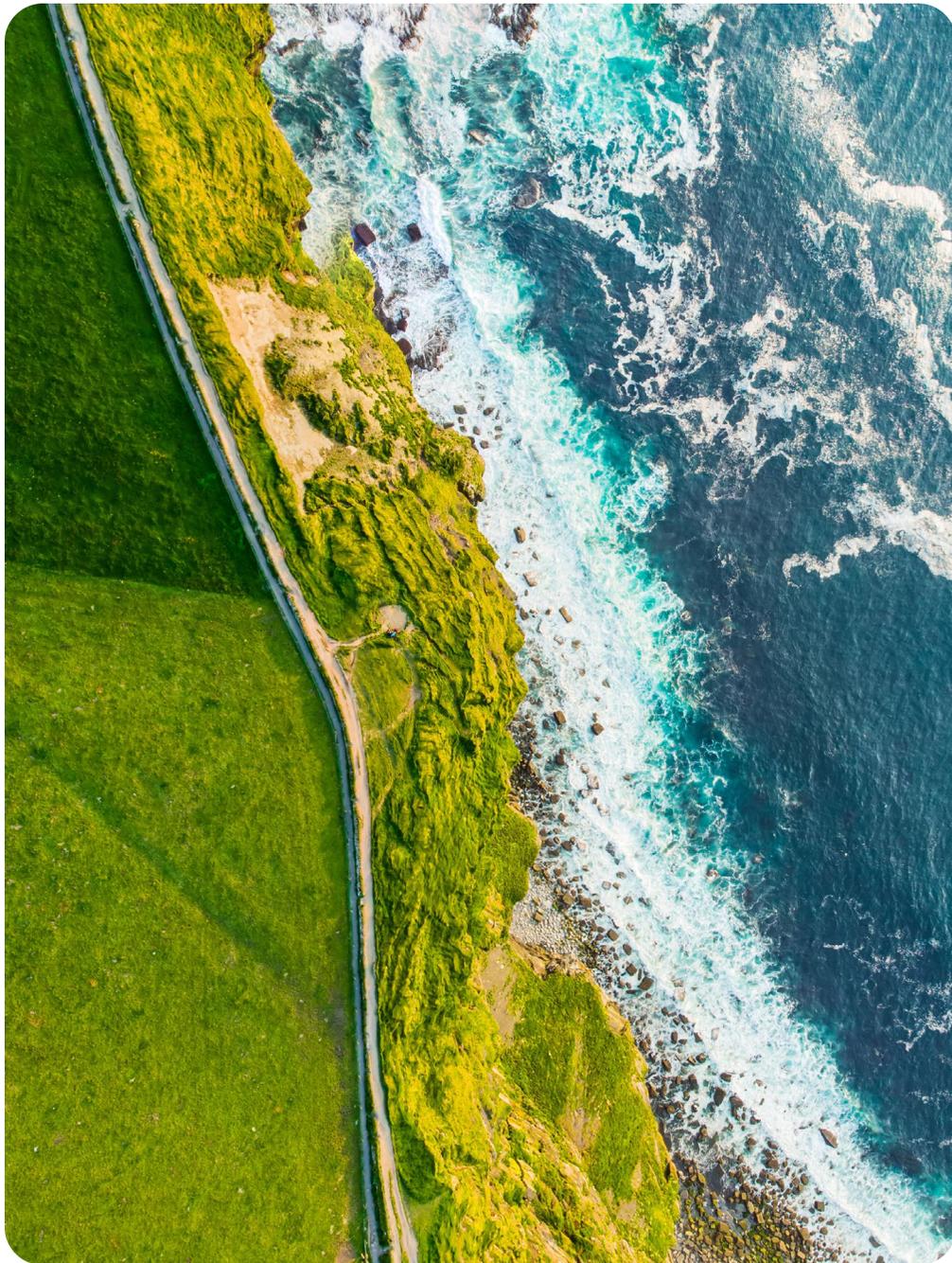
Carestation 750 anesthesia machine
- Cardboard: 41%
- Wood: 16%
- Metal: 3%
- Other: 40%

Carestation 750c anesthesia machine
- Cardboard: 41%
- Wood: 16%
- Metal: 4%
- Other: 39%

Carestation 750 packaging material utilized in the Wuxi, China site consists of following materials (% per weight):[7]

- Wood: 61%
- Cardboard: 19%
- Metal: 3%
- Other: 17%

Manufacturing

Through our environmental reviews, we also focus on implementing more renewable energy and reducing waste, when possible.

Renewable energy	Madison Gas and Electric, which supplies the Madison, WI USA manufacturing plant, sources 25% of its power from renewable sources.[13]
	The Wuxi, China manufacturing plant has a solar rooftop system which generates approximately 1,000,000 kWh/year.[7]
Reducing electricity	Through our environmental reviews, we are committed on implementing renewable energy and reducing waste in our manufacturing.[7]

Product utilization

Our anesthesia products are designed to help enable energy efficiency through dedicated features and advanced applications, to reduce the environmental impact and extend product life through new optional configurations, and to help enhance health and potentially reduce environmental impacts by reducing waste through ergonomic design.[7]

Medical electrical equipment	Complies with IEC 60601-1-6 international standard for medical electrical equipment to ensure usability, as it relates to basic safety and essential performance,[14] aligned with the engineering usability process set forth in IEC 62366-1.[15]
Power consumption	Instructions for use provide direction to minimize the enviornmental impact of the equipment during installation, use, and operation. • User-determined display brightness to reduce engergy consumption of backlighting[7] • Average energy consumption is 0.056kW[16]
Cybersecurity	GE HealthCare's Design Engineering Privacy and Security (DEPS) process follows GDPR, HIPAA, NIST 800-53, NIST 800-30, ISO 27001, and NIST CSF requirements.[7]

End of product life

We are increasingly putting our retired products' materials back into the supply chain to maximize efficient use and minimize unnecessary waste. This circularity model enables our anesthesia delivery products to extend their clinical impact through longer lifespans while reducing the environmental footprint. Additionally, we offer our customers support for upgrades and services throughout a product's lifespan, when available, to maintain optimal performance and help drive better patient outcomes.

Product utilization

Guidance for end of lifecycle	Equipment instructions are provided to minimize the environmental impact for disposal or recycling.
Upgradeability	Expected service life for the Carestation 750 series anesthesia machine is 7 years; however, preventive maintenance as well as available hardware and software upgrade options may extend the product lifespan.[7]
Service	The Carestation 750 anesthesia machine is compatible with the Mural™ Virtual Care Solution toolkit, which provides the ability to remotely diagnose issues, retrieve device logs, and includes an application for executing and documenting planned maintenance.[7]
Waste reduction	This system is in accordance with Waste Electrical and Electronic Equipment (WEEE) regulations.[9]
Cleanability	Our equipment is designed to be cleaned and disinfected easily. We continue to test and approve new cleaning and disinfecting agents. Visit *Cleaning.GEHealthCare.com* for updates.

Digitizing healthcare through transformative innovations for a more resilient tomorrow[1]

We are committed to investing in digital capabilities that help accelerate clinical decision making, optimize anesthesia delivery operations, and drive efficiencies in perioperative workflows, all of which can help clinicians improve patient outcomes. Enabling digital transformation will further enhance our predictive and maintenance service operations for the life of your products.

We are also dedicated to driving a more resilient and sustainable future in healthcare. Many factors, including the pandemic, climate-related weather disasters, and supply-chain issues amplified this need. Managing operations through these challenges requires resilience and perseverance.

Optimizing sustainable anesthesia care

Our advanced software algorithms on the Carestation 750 Series Anesthesia Delivery Systems are designed give you critical data in real time, so you can optimize anesthesia protocols and patient safety, while minimizing harm to the environment.

Minimize PPCs with LPV strategies	Improper ventilation during anesthesia can increase postoperative pulmonary complications (PPCs) by up to 60%.[2] The lung protective ventilation (LPV) tools on the Carestation 750 workstation provide you with the resources to configure automated lung recruitment maneuvers. These programmable steps can enhance your ventilation techniques, allowing for precise control of PEEP levels during mechanical ventilation.
Safely reduce anesthetic agent waste with ecoFLOW software	• With ecoFLOW clinicians can practice low-flow anesthesia by setting a visual indicator for inspired O_2 concentration (FiO_2) to help identify unnecessarily high fresh gas flow rates and minimize the risk of delivering a hypoxic mixture to the patient. • ecoFLOW allows clinicians to view anesthetic agent consumption and cost in real time on the machine display to help them adjust settings as needed. • Using ecoFLOW allows clinicians to practice low-flow anesthesia delivery with confidence and ease, helping to minimize volatile agent waste that contributes to greenhouse gas emissions. • In one study, Carestation 750 with ecoFLOW software has shown to reduce volatile agent utilization by 30%,[1] correspondingly reducing greenhouse gas emissions.*

Optimizing sustainable anesthesia care

|	
Unified monitoring platform for your entire perioperative ecosystem	Requiring 25% less electricity consumption[17] and 48% less packaging of material mass[18] than its predecessor, CARESCAPE Canvas™ Patient Monitor offers a high-end, intuitive design with a responsive touchscreen, allowing for individualized monitoring of patients and bed-specific scalable levels of acuity while retaining the same, familiar user experience and cleaning simplicity for effective infection control.
Reduce anesthetic agent waste and accelerate recovery/discharge with a more personalized anesthesia dose	In a clinical trial, Entropy™ (EEG & FEMG signal) Monitoring has been associated with a 30% reduction in Sevoflurane/Isoflurane usage[4] and a 15% reduction in Propofol.[5] Supplemented by other monitored parameters, Entropy provides a complete picture of the patient's status on screen, allowing the anesthesia provider to customize anesthesia for each patient at a lower fresh gas flow rate.
AMSORB® Plus CO_2 Absorbent	• Eco-friendly—This unique absorbent formulation breaks down into harmless organic compounds and does not produce harmful by-products, such as carbon monoxide (CO),[19] Compound A,[19] or formaldehyde,[19] so it's easier on patients and staff—and potentially simpler to dispose of by not going into medical waste. • **Efficient**—Violet color indicator lets you know when it's time to change the canister, improving confidence in clinical and purchasing decisions. • **Cost-effective**—Low-flow anesthesia delivery reduces consumption of the anesthetic agent and lowers overall cost of ownership.
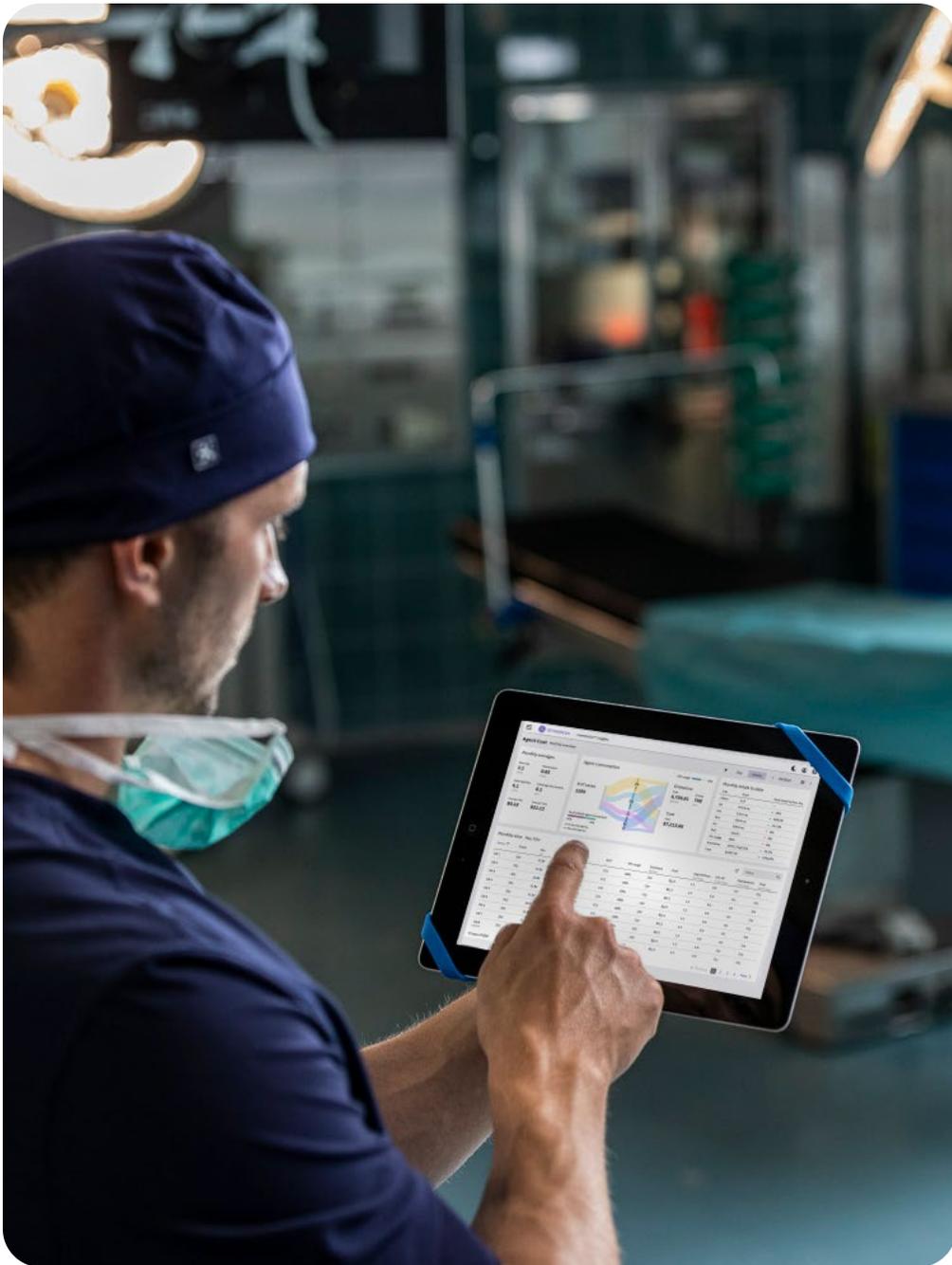
Optimizing sustainable anesthesia care

Carestation™ Insights Applications

Carestation™ Insights Applications data is automatically transmitted to a cloud-based analytics platform, which provides visibility to agent utilization, cost, emissions impact, and more on any computer or mobile device internet browser. When used to monitor agent consumption and drive adherence to low-flow protocols, Carestation Insights applications support an additional 13% reduction in fresh gas flows.[20]

- **Agent Cost Application**—Provides an analysis of anesthetic agent use and costs across your department and helps support low-flow initiatives that may help reduce agent costs and agent emissions into the environment.

- **Adequacy of Anesthesia (AoA) Application**—View real-time* and historical AoA data measured against customized performance targets. See the impact of AoA practices on emergence times and track anesthetic agent costs.

- **Checkout Application**—Keep track of Carestation 750 anesthesia machines that have completed the checkout procedure to help improve scheduling workflows and protect patients against injury.

- **Lung Protective Ventilation Application**—View ventilation settings and patient lung response from the Carestation 750 machine. Use the data to support lung protection initiatives to help drive improved clinical outcomes and help reduce PPCs.

- **OR Workflow Application**—View case phase and OR status in real time* without the need for manual data entry. An OR efficiency score card is also calculated based on your goals to help track improvements over time.

* Actual time may vary slightly due to hospital network and processing times.

References

1. Shores R, Meuti K, Hogan G, Pabalate J. Nursing Economics; Pitman Vol. 40, Iss. 3, (May/Jun 2022): 109-117

2. Futier, E., M.D., Constantin, J., M.D., PhD., et al. A Trial of Intraoperative Low-Tidal-Volume Ventilation in Abdominal Surgery. The New England Journal of Medicine, 369(5):428-437. Aug 2013. DOI: 10.1056/NEJMoa1301082

3. Andreas Güldner, Thomas Kiss, Ary Serpa Neto, Sabrine N. T. Hemmes, Jaume Canet, Peter M. Spieth, Patricia R. M. Rocco, Marcus J. Schultz, Paolo Pelosi, Marcelo Gama de Abreu; Intraoperative Protective Mechanical Ventilation for Prevention of Postoperative Pulmonary Complications: A Comprehensive Review of the Role of Tidal Volume, Positive End-expiratory Pressure, and Lung Recruitment Maneuvers. Anesthesiology 2015; 123:692–713 doi: https://doi.org/10.1097/ALN.0000000000000754

4. El Hor T, et al. Impact of entropy monitoring on volatile anesthetic uptake. Anesthesiology. 118(4):868-73. Apr 2013. DOI: 10.1097/ALN.0b013e3182850c36. PMID: 23337606.

5. Vakkuri A, et al. Spectral entropy monitoring is associated with reduced propofol use and faster emergence in propofol-nitrous oxide-alfentanil anesthesia. Anesthesiology. 2005 Aug;103(2):274-9. doi: 10.1097/00000542-200508000-00010. PMID: 16052109

6. Karliner J, Slotterback S, "Health Care's Climate Footprint How the Health Sector Contributes to the Global Climate Crisis and Opportunities for Action." Health Care Without Harm Climate-smart health care series Green Paper Number One, Produced in Collaboration with ARUP. September 2019, https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint_092319.pdf

7. GE HealthCare Carestation 600 Series and 750 Series Environmental Product Collateral Data Substantiation. DOC2850126 Rev 3. January 2024

8. GE HealthCare CS700 Series 60601-1-9-2013 Test Results. DOC2180758 Rev 1. September 2019

9. GE HealthCare CS700 Series LCS Anesthesia Machines WEEE Test Results. DOC2221427 Rev1. August 2019

10. GE HealthCare CS750 Series Summary Of Recycled Material. DOC2555751 Rev 1. April 2021

11. GE HealthCare CS750 RoHS Compliance Report. DOC2273298 Rev 2. July 2021

12. GE HealthCare ARC EU REACH Substance Compliance Information. DOC2798430 Rev 3. November 2023

13. GE HealthCare Aisys CS2 Environmental Product Collateral Data Substantiation. DOC2895863 Rev 1. September 2023

14. GE HealthCare CS750 Series IEC 60601-1-6-2010 Test Report. DOC2180780 Rev3. November 2019

15. GE HealthCare CS750 Series IEC 62366-1-2015 Test Report. DOC2180743 Rev 2. October 2019

16. GE HealthCare CS700 and CS600 Proteus Power Consumption Testing Result. DOC2672915 Rev 2. January 2019

17. GE HealthCare CARESCAPE Canvas and Bx50 Power Consumption Measurements and Energy Usage. DOC2742033 Rev 3. December 2022

18. GE HealthCare Monitoring Solutions HKI Product Packaging Volume and Weight Data. DOC2770171 Rev 2. January 2023

19. Kharasch ED, Powers KM, Artru AA. Comparison of Amsorb, sodalime, and Baralyme degradation of volatile anesthetics and formation of carbon monoxide and compound a in swine in vivo. Anesthesiology. 2002 Jan;96(1):173-82. doi: 10.1097/00000542-200201000-00031. PMID: 11753018.

20. Cucchia, M., Piergiovanni, C., Toni, G., Ciarapica, C., Driving Down Greenhosue Gas Emissions While Saving Cost on Anaesthetic Agents: A case study using Carestation Insights™ Agent Cost Application. GE HealthCare Whitepaper JB23747XX, May 2023

Creating a healthy world to help enable better patient outcomes.

GEHealthCare.com/about/sustainability

GE HealthCare