

Product Environmental Report

UHD Signage QMC

09/24/2024



At Samsung, we work to integrate eco-conscious technology and innovation in our products. By considering sustainability at every step of the product life cycle, we aim to empower our customers to join us in our journey to build a better tomorrow together.



[1]

* Certification : QM55C



[2]



[3]

* Certification [2] [3]
: QM32C, QM43C, QM50C, QM55C,
QM65C, QM75C, QM85C, QM98C



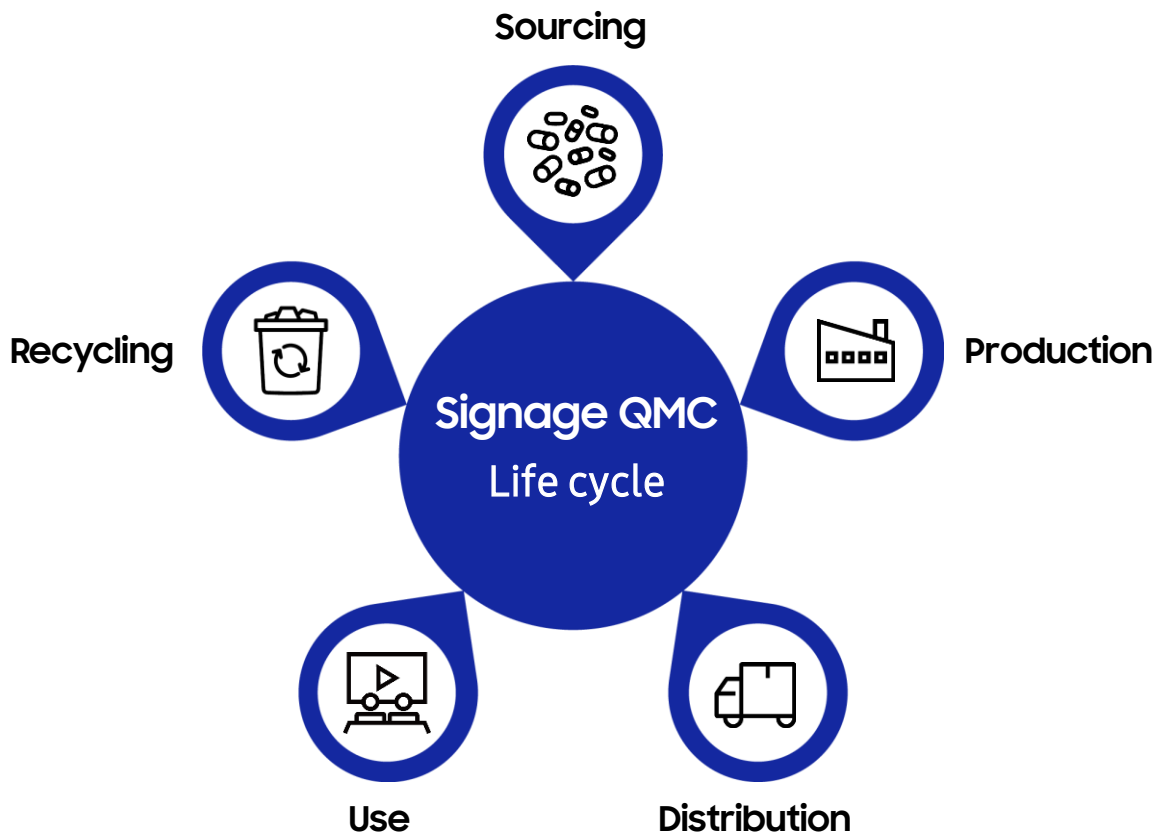
[4]

* Certification : QM50C

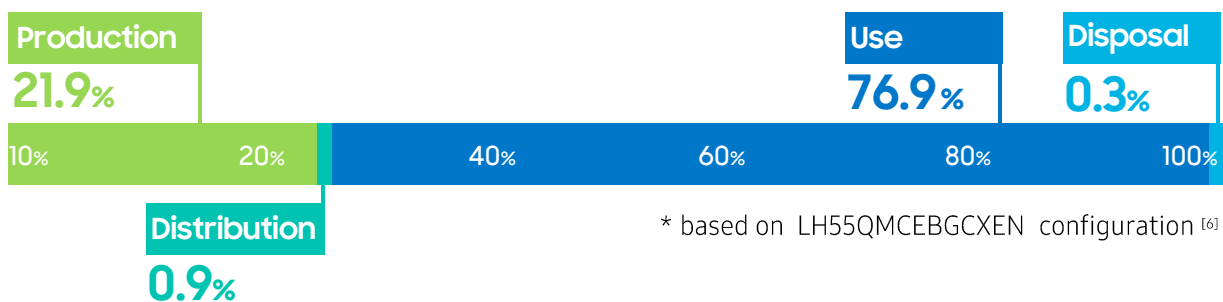
Product Carbon Footprint

At Samsung Electronics, we assess a product's entire life cycle, including the sourcing, production, distribution, product use, and recycling phase, to understand the environmental impacts of our products.

At the production stage, we are aiming to expand the development and application of recycled materials with a lower carbon footprint. At the distribution stage, we are working to minimize packaging volume and weight to reduce greenhouse gas emissions. Through improving product energy efficiency, we are trying to improve the environmental impact at the use stage.

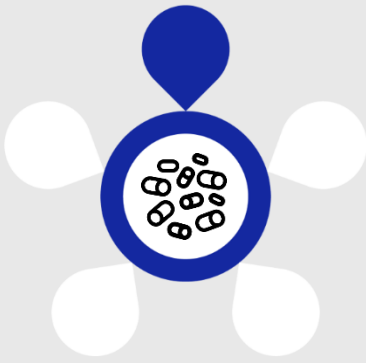


Signage QM55C Life cycle carbon emissions : 1,691 kg CO₂eq .^[5]



※ The environmental impact of one product over the entire life cycle is equivalent to the above figure calculated in CO₂ emissions^[6]

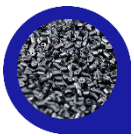
Sourcing



Samsung Electronics is committed to improving resource circulation throughout the life cycle of electronic products, from raw materials to disposal and recycling.

To build toward a circular system, we are endeavoring to use recycled materials and collecting e-waste to extract materials for reuse. By 2030, we aim for 50% of the plastic used in our DX products to incorporate recycled resin. By 2050, we will see this figure increase to 100%.

Samsung Electronics uses recycled materials for parts in the Signage QMC products. In addition, we are trying to manage its supply chain so that minerals used in its products are mined in accordance with OECD due diligence guidelines.



Plastic

QMC's rear cover contains a minimum of 10% recycled materials (Polycarbonate). ^[7]



Responsible minerals

For internationally disputed minerals such as tantalum, tin, tungsten, and gold, we elect to only use minerals supplied by smelters that have obtained global third-party certifications. Minerals that raise human rights violations or environmental destruction issues during mining are included in the list of management ^[8] and are avoided in our management of the mineral supply chain.



Chemical Mgmt.

To prevent hazardous substances from entering our products, we rigorously inspect manufactured parts and raw materials through our chemical management system.

Our standards for the Control of Substances Used in Products ^[9] are based on global regulations and standards. We voluntarily established reduction plans for the use of potentially hazardous substances as well as legally regulated substances.

Production



We are expanding the use of renewable energy at our business sites around the world.

Energy infrastructure and regulations vary widely by jurisdiction and require region-specific transition plans.



Renewable
Energy

We plan to run all operations of the DX division on renewable energy by 2027. ^[10]

We are constantly trying to reduce waste and expand recycling. We plan to obtain platinum-level classification under the Zero Waste to Landfill Certification, issued by safety certification organization Underwriters Laboratories (UL), for all our global operations by 2025.

Sites that produce Samsung Electronics TV, audio, and display products have been certified for environmental management (ISO14001) and energy management (ISO50001). ^[11]



Reducing material
& Scrap recycling

Samsung Electronics is increasing the efficiency of using raw materials to reduce environmental impact during the production stage. We are using External Gas Molding (EGM) technology, which uses air instead of plastic to shape parts, thus reducing the amount of plastic used in the injection process.



Distribution



To reduce the environmental impact of our product packaging, we are replacing plastic packaging and vinyl wraps with paper and recycled materials.

We are also reducing the volume and weight of packaging to mitigate greenhouse gas emissions in the transportation and shipping process.



Packaging

We plan to remove plastic from packaging (except cushions) of all TV, audio, and display products by 2030 and replace them with paper.

When packing the product, the expanded polystyrene (EPS) cushion, which is discarded after one-time use, is collected, reprocessed, and mixed with new materials to make new cushioning.^[12] *The waste EPS collection process of our products is currently carried out only in the Republic of Korea.

Recycled materials are all applied to accessory bags and PP bands, which are packaging materials for product packaging.^[13]

Plastic
tape/band
removal

100%

For products larger than 65", the plastic tape that seals the packaging box has been removed, and the plastic band that binds the accessory cable has been changed to paper.^[14]

Metal staple
removal

100%

Recyclability of the paper box was enhanced by removing the metal staples used in the side joints of the box.^[15]



Use



Environmental experts provide consultation during product development at Samsung Electronics so we can empower our customers to use our products more sustainably.

During the product development phase, our stress tests help ensure the longevity and consistent performance of our products.



Energy
Efficiency

To reduce greenhouse gas emissions during the use of our key products, we set our plan to reduce power consumption by 30% on average by 2030, compared to products with the same specifications in 2019. ^[16]

* Power consumption of QMC ^[17]

Our Signage's remote management solution provides an environment where you can access all devices at any time to manage them. "Remote Control" makes it easy to turn screen power on or off, adjust brightness through "Setting Control," and monitor devices in real time through "Status Monitoring." Remote management can reduce power consumption caused by devices that remain turned on unnecessarily or turned on brighter than necessary.



Repair &
Reuse

For the parts of TV and display products that have been replaced by modules, we are changing the design so that they can be separately repaired. ^[18]





Use

Environmental experts provide consultation during product development at Samsung Electronics so we can empower our customers to use our products more sustainably.

During the product development phase, our stress tests help ensure the longevity and consistent performance of our products.

We are developing solutions that support energy efficiency at the use stage.



Embedded media player

Samsung's built-in System on Chip (SoC) technology does not require additional power consumption for an external media player box.

Screen lamp schedule

It is possible to reduce unnecessary power consumption by darkening the brightness by specifying a desired time.

Sleep mode

When the video input signal is cut off, the product automatically enters sleep mode. This can reduce power consumption by changing from normal power consumption to 0.5W when switching to sleep mode.

On & Off timer

You can set the timer to turn the screen on and off automatically on pre-specified times and days of the week. It is also possible to temporarily disable the timer for designated period of time. This can reduce power consumption by changing from normal power consumption to 0.5W on such pre-designated period.

Recycling



To promote the circular economy and a low-carbon society, we are expanding responsible recycling more than 50 countries around the world.

Samsung's local recycling programs provide collection services tailored to each region for customers disposing e-waste, and we take back electrical and electronic waste regardless of product brand.



Repair & Reuse

We are trying to reuse parts to reduce waste even in the repair process of TV and display products. In 2022, about 550,000 parts were recovered from 36 countries, and 230,000 of them have been reused after quality verification.



Upcycle Packaging

Our upcycle packaging is designed to allow consumers to upcycle the box that is usually discarded after transporting the product. We are striving to reduce impact on the environment and increase packaging recyclability by removing promotional stickers that were attached to the box surface and reducing ink usage.

Customers can make their own props such as magazine stands and pet products using dot patterns printed on the surface of the packaging box. We are diversifying props designed through campaigns and contests. ^[19]



* Package design that reduces ink usage

Endnotes

Disclaimer

1. The Carbon Trust of the U.K. calculated greenhouse gas generated in the entire process from production to disposal of products in accordance with evaluation standards, and Samsung obtained a "carbon footprint" certification that evaluates carbon emissions of products.

Certification model: QM55C

※ In particular, "Carbon Footprint-Reducing CO₂" certification can be obtained when carbon generation is reduced compared to previous equivalent models.

2. ENERGY STAR is a program in which the Environmental Protection Agency(EPA) of the United States certifies that it is an energy-efficient product among various electrical and electronic products.

Certification model: QM32C, QM43C, QM50C, QM55C, QM65C, QM75C, QM85C, QM98C

3. EPEAT(Electronic Product Environmental Assessment Tool) is an eco-friendly certification system for electronic products in the United States and is certified in three grades: Gold, Silver, and Bronze by evaluating various items such as prohibition of the use of harmful substances, energy efficiency of products, ease of decomposition and recycling of products and packaging materials, and corporate social responsibility.

Certification grade: EPEAT (Bronze)

Certification model: QM32C, QM43C, QM50C, QM55C, QM65C, QM75C, QM85C, QM98C

4. TUV Rheinland(Germany) certifies that Samsung Electronics has correctly measured carbon footprints by applying the 'ISO 14067:2018' standard.

Certification model: QM50C

5. Guidelines and conditions applied to the calculation of carbon emissions

- PAS 2050:2011 – Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
- ISO 14067:2018 - Carbon footprint of products
- Database : Ecoinvent 3.9.1, Korea LCI DB, EU Electricity Emission Factors 2022 (IEA)

6. Life Cycle Assessment System Boundary

- Production: Pre-manufacturing (parts and materials that make up the product) and assembling the product at Samsung Electronics
- Distribution: Distribution from Vietnam to the Netherlands
- Use: Used for 5 years
- Disposal: Waste disposal of parts and materials

7. Environmental Claim Validation (ECV) verification was obtained from UL for recycled materials

Verification method: Environmental Claim Validation Procedure for Recycled content, UL 2809 – Fifth Edition

- QMC rear cover: contains a minimum of 10% recycled PC(polycarbonate) (based on weight)

8. Samsung Electronics operates a mineral management process based on OECD due diligence guidelines for responsible minerals.

<https://www.samsung.com/global/sustainability/people/supply-chain/#anchor4>

9. Product Environment Management Substances Operation Rules

<https://www.samsung.com/global/sustainability/digital-library/policy-document/>

Endnotes

10. Details of the conversion of renewable energy

Samsung Electronics joined RE100, a global initiative, to reduce indirect carbon emissions (Scope 2) and is pursuing the conversion of used electricity to renewable energy by 2050. First, Samsung Electronics aims to achieve its renewable energy target at all overseas operations by 2027. In the case of the US, China, and Europe, which have already reached this target, we plan to expand direct power purchase agreements (PPAs) centering on the regions equipped with active renewable energy policies and systems. The DX division aims to achieve its renewable energy target by 2027, both at home and abroad.

※ Samsung Electronics' Device eXperience (DX) division is in the business of producing and selling TVs, monitors, refrigerators, washing machines, air conditioners, smartphones, tablets, PCs, and wearable products. <https://www.samsung.com/global/sustainability/planet/climate-action/#anchor2>

11. Samsung Electronics adopts global standards such as environmental management (ISO14001) and energy management system (ISO50001), mandates all workplaces to obtain the certification, and recommends partner companies to obtain related international certifications to spread environmental safety management, which is reflected in the comprehensive evaluation of partner companies.

Except for one small production subsidiary (SSAP) in South Africa, all of Samsung Electronics' workplaces have obtained the certification as of 2021, and 86% of partners that are subject to comprehensive evaluation.

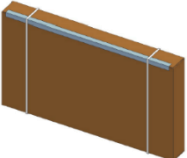
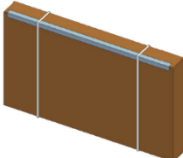
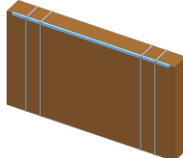
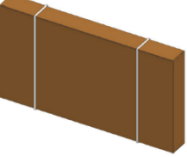
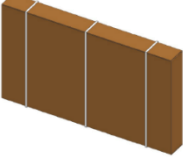
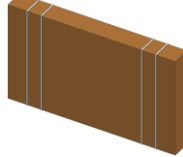
12. Recycled EPS

- After collecting and reprocessing EPS cushions that are discarded after one-time use during product packaging, cushions (renewable EPS 5% + unrecycled 95%) were produced by mixing them with unrecycled materials.

13. The recycled materials applied to the product packaging materials are as follows.

- Packaging Materials Containing 50% Recycled Plastics: Accessories Bag, PP Band

14. We no longer use plastic tape for box sealing for products larger than 65", which is applied separately as shown in the table below according to the product size.

	65" Upper/lower detachable box	75"~85" Upper/lower detachable box	98" Upper/lower detachable box
Before			
After (2023~) *98" : 2024~			
Changes	- No longer apply Top Plastic Tape	- No longer apply Top Plastic Tape - Adding a central PP band	- No longer apply Top Plastic Tape

15. Recyclability of paper boxes was increased by removing metal staples and replacing them with glue. The reduction of box assembly process time also reduced energy consumption in the manufacturing process.

16. We plan to reduce power consumption by an avg. of 30% in 2030 compared to the same performance model in 2019 by applying low power technology to representative models of seven major electronic products such as TVs, monitors, smartphones, refrigerators, washing machines, air conditioners, and PCs. We are conducting twice/yearly implementation checks on the annual improvement goals of the representative models for each product line, and we are trying to spread the energy efficiency technology applied to the representative models horizontally to other models.

Endnotes

17. Typical power consumption of QMC

Model (Inch)	QM32C (32")	QM43C (43")	QM50C (50")	QM55C (55")	QM65C (65")	QM75C (75")	QM85C (85")	QM98C (98")
Average power consumption	29W	73W	84W	102W	135W	151W	237W	197W

Power consumption measurement criteria: Regulation (EU) No 2019/2021 (as amended) and EN 50564:2011
Power consumption is calculated based on the power measured in our laboratory in 2023 based on the respective prerelease model.

Different countries have different regulatory conditions or measurement standards, and measurement methods may be updated to change measurements when each country's regulatory conditions change.

The model name/model code of the product may vary by region or country where Samsung Electronics sells the product.

18. By applying about 230,000 single-product repairs in 102 countries of about 49 subsidiaries in 2022, we are trying to reduce the burden of repair costs on consumers by reducing about \$151 compared to the previous average repair costs, as well as reducing environmental impact by extending the life of products. (availability may vary by country)

19. Providing drawings for upcycle packaging production props

<https://www.samsung-upcyclepackaging.com>

Corporate Sustainability Management

Samsung is constantly striving to deliver innovative products and services across the value chain. This is rooted in our core values in economy, society and environment. Therefore, we monitor the financial and non-financial impacts that we exert on society in order to maximize our positive impacts while minimizing any negative ones.

<https://www.samsung.com/global/sustainability/main/>

Environmental Strategy

Samsung Electronics announced the New Environmental Strategy in September 2022 with the aim of addressing global environmental issues through our innovative technologies. This paradigm shift is essential for our sustainable growth and will create meaningful momentum to reinforce our competitiveness.

The New Environmental Strategy was developed based on our commitment to achieve net zero by 2050 joining the world's drive to combat climate change; maximize resource circularity to advance towards a circular economy; and continuously address environmental challenges with technological innovation. This effort is expected to bring positive change to the broader ecosystem of the ICT industry as we engage in the manufacturing and supply of an extensive range of products and services.

<https://www.samsung.com/sec/sustainability/planet/environmental-strategy/>

Circular Economy

We aim to create a more sustainable resource cycle by using recycled materials and researching methods to extract and re-use resources from e-waste.

<https://www.samsung.com/global/sustainability/planet/circular-economy/>



Carbon Footprint Label

Samsung Electronics

has measured and achieved a reduction in the product carbon footprints of their

Smart Signage Display
(LH55QBC***, LH55QMC*****, and**
LH55QHC***)**

Carbon Trust Assurance has certified that this project has met all the requirements for using the Carbon Trust Carbon Footprint Label.



The above is the generic version of the Carbon Trust Label which you are licensed to use, you may agree bespoke text with the Carbon Trust if you wish to use alternate text.

A full description of the scope of certification and a detailed list of certified Carbon Footprints and Reductions results can be found in the associated Certification Letter CERT-13530

Awarded: 08 August 2023

Valid Until: 08 August 2025

for and on behalf of Carbon Trust Assurance Ltd,

A handwritten signature in black ink, appearing to read "M Hockaday".

Martin Hockaday,
Head of Assurance

This certificate is for presentation purposes only. Please do not copy or circulate this certificate without the Certification Letter and associated Annexes where full details on the scope of the certification are documented. This certificate remains the property of Carbon Trust Assurance Limited and is bound by the conditions of the contract. Information and Contact: Carbon Trust Assurance Limited is registered in England and Wales under Company number 06547658 with its Registered Office Level 5, Atrium, 255 Blackfriars Road, London SE1 9AX, UK. Telephone: +44 (0) 20 7 170 7000. Carbon Trust Assurance Limited is a fully owned subsidiary of the Carbon Trust.

CERTIFICATE

Certificate-ID: C02-2023-06-21259157

Certificate for: **Crystal UHD Signage QM50C**

Certified: Samsung Electronics Co., Ltd.
129 Samsung-Ro, Yeoungtong-
Gu, Suwon-Si, Gyeonggi-Do,
Korea

SAMSUNG

Applied Standard: ISO 14067: 2018

Review Report: ADTR-PEF-0012

Valid until: June 30th 2024

TÜV Rheinland confirms that Samsung Electronics Co., Ltd. has determined the CO₂e footprint for the Crystal UHD Signage QM50C correctly by applying the standard mentioned above. The calculation was carried out within the system boundaries "cradle to grave". The certificate is based on the calculations of the Product Carbon Footprint. Specifications and assessment limits can be found in the review report. The validity can be authenticated using the QR code, or the test mark ID at www.certipedia.com.

Cologne, 07 June 2023

Ran Tao

Ran Tao
TÜV Rheinland Group
Sustainability and Carbon Services

S. Jorje

Susanne Jorje



Product Carbon
Footprint
Regular
Surveillance



www.tuv.com
ID 0000085171

Certificate of Conformance

Energy Efficiency Certification

UL conducted an independent evaluation on behalf of:

Samsung Electronics Co Ltd

129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, Gyeonggi-do, 16677, Republic of Korea

for the following products:

Displays

Brand: SAMSUNG

Model: See Appendix A

This product meets all of the necessary qualifications pursuant to:

ENERGY STAR® PROGRAM REQUIREMENTS FOR DISPLAYS - VERSION 8.0 - Issue Date 2020/01/28



Energy Verified

2023-05-30

Certification Date

Certification Revision Date

Issued by

4790862491

UL Certificate Name

SCC File Number 10072

This is to certify that representative samples of the Certified Product(s) listed above have been investigated by UL to the Standard(s) indicated on this certificate, in accordance with the UL Global Services Agreement and the EEC Terms & Conditions ("Agreement"). The Certificate Holder is entitled to use the UL Energy Verified Mark for the Certified Product(s) listed on the certificate and manufactured at the production site(s) covered by the UL Test Report, in accordance with the terms of the Agreement. This Certificate shall remain valid unless a Standard identified on this Certificate is amended or withdrawn prior to that date or there is a non-compliance with the Agreement.

Model Name	Model Number	Family Models		Additional Identifying Information
		Model Name	Model Number	
QM55C	QM55C	LH55QMCEBGCXZA	LH55QMCEBGCXZA	Same as basic model except model designation.
		LH55QMCEBGCXGO	LH55QMCEBGCXGO	Same as basic model except model designation.
		LH55QMCEBGCX**	LH55QMCEBGCX**	Same as basic model except model designation. * can be any alphanumeric character



Samsung Electronics Co.Ltd
129 Samsung-Ro, Maetan-3dong, Yeongtong-gu, Suwon-si,
Gyeonggi-do, Korea

Declaration of RoHS Compliance for QMC Series

Samsung Electronics Co. Ltd (the "Company") hereby declares that QMC Series placed on the European Community market by the Company and its subsidiaries are compliant with Directive 2011/65/EU on the Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment. (### can be any alphanumeric character or blank)

RoHS compliant means that where the product falls under the scope of the EU RoHS Directive, this product does not contain the following substances:

- Lead (0,1 %)
- Mercury (0,1 %)
- Cadmium (0,01 %)
- Hexavalent chromium (0,1 %)
- Polybrominated biphenyls (PBB) (0,1 %)
- Polybrominated diphenyl ethers (PBDE) (0,1 %)
- Bis(2-ethylhexyl) phthalate (DEHP) (0,1 %)
- Butyl benzyl phthalate (BBP) (0,1 %)
- Dibutyl phthalate (DBP) (0,1 %)
- Diisobutyl phthalate (DIBP) (0,1 %)

In excess of the indicated maximum concentration values by weight in homogenous materials, unless the substance is subject to an exemption specified in the Directive¹. All products are compliant with the CE marking and further information requirements as foreseen by Directive 2011/65/EU.

This declaration represents the Company's knowledge and belief which is partially based on information provided by third party suppliers.

Further details about Samsung Electronics' RoHS compliance programme can be found in the accompanying FAQ document or at:

http://www.samsung.com/uk/aboutsamsung/samsungelectronics/corporatecitizenship/data_corner.html

Signature : Handong Kim 
Global Customer Satisfaction Team

2023-11-10

Name : Handong Kim
Jop position/Title : CL3/Product Quality Group

¹ http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm



Samsung Electronics Co., Ltd
129, Samsung-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, Korea

Declaration of REACH Substances of Very High Concern (SVHCs) Disclosure

Model : QMC Series

Dear Customer:

The European Regulation 1907/2006 on the *Registration, Evaluation, Authorization, and Restriction of Chemicals* (REACH) entered into force on 1st June, 2007.¹

Article 33 of REACH requires suppliers to inform recipients and respond to consumer enquiries if an article contains more than 0.1% (by weight per article) of any substance on the candidate list of Substances of Very High Concern (SVHC).²

Samsung Electronics Co. Ltd (the "SEC") hereby declares the presence of substances on the SVHC candidate list which are contained in a quantity of more than 0.1% (w/w) in the above product and / or its packaging³ placed on the European Community market by the SEC and its subsidiaries.

The substances on the REACH SVHC candidate list in concentrations greater than 0.1% by weight per article are listed below.

Substance name	CAS No.	Application
Lead	7439-92-1	ASSY ACCESSORY MANUAL CABLE ASSY PCB MAIN
1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)	2451-62-9	ASSY BACK LIGHT UNIT
1-vinylimidazole	1072-63-5	ASSY CHASSIS FRONT P
Boric acid, crude natural	11113-50-1	ASSY OPEN CELL

Handong Kim

Signature: Global Customer Satisfaction Team

Date: 2023-08-28

Name : Handong Kim

Job position/Title : CL3 / Product Quality Group

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:396:0001:0849:EN:PDF>

² SVHC = Substances of Very High Concern. Considered as candidates for inclusion in Annex XIV of REACH.

The latest revision to the candidate list was published by the European Chemicals Agency on 19th January 2021 at: <https://echa.europa.eu/candidate-list-table>

³ Reference: ECHA Guidance on requirements for substances in Articles.



Samsung Electronics Co.Ltd
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,
16677, Republic of Korea

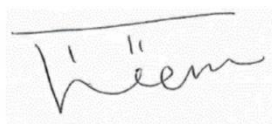
Declaration of compliance with Directive 2012/19/EC (WEEE)

Samsung Electronics hereby declares that all products placed on the European Union internal market from 13th August 2005 are compliant with Directive 2012/19/EU (formerly 2002/96/EC) of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE).

Electrical and Electronic Equipment supplied by Samsung Electronics complies with the following requirements:

1. Marking requirement - all Samsung products that are subject to the WEEE Directive shipped to the European Union from August 13th 2005 are compliant with the WEEE marking requirements. Such products are marked with the “crossed out wheelie bin” WEEE symbol in accordance with European Standard EN 50419.
2. Information for end users - according to the requirements of European Union member state WEEE legislation, information is provided to customers in several languages for all Samsung branded products subject to the WEEE directive.
3. Information to recyclers - as required by the WEEE Directive, on demand Samsung provides reuse and treatment information for each type of new EEE within one year after the equipment is put on the market.

Samsung Electronics is member of an approved WEEE producer compliance scheme in all EU countries where it has a legal presence in accordance with national law.



Signature :

Date : Feb 14, 2022

Youngjin SUH

Vice President/Head of Products Environment Team

Global CS Center

SAMSUNG Electronics Co., Ltd.