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.
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 QM55B Life cycle carbon emissions: 1,817 kg CO₂eq. \(^{[3]}\)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>23.6%</td>
</tr>
<tr>
<td>Use</td>
<td>75.8%</td>
</tr>
<tr>
<td>Disposal</td>
<td>0.3%</td>
</tr>
<tr>
<td>Distribution</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

*The environmental impact of one product over the entire life cycle is equivalent to the above figure calculated in CO₂ emissions \(^{[4]}\). This is equivalent to the amount of carbon generated by a gasoline powered car that travels approximately 7,256 km \(^{[5]}\).*
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 QMB 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**

QMB’s rear cover contains a minimum of 10% recycled materials. [6]

**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 [7] and are avoided in our management of the mineral supply chain.

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 [8] 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.

We plan to run all operations of the DX division on renewable energy by 2027. [9]

We are constantly trying to reduce waste and expand recycling. We plan to obtain a platinum-level 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). [10]

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.

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.\(^{[11]}\) *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.\(^{[12]}\)

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.\(^{[13]}\)

Recyclability of the paper box was enhanced by removing the metal staples used in the side joints of the box.\(^{[14]}\)
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.

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. [5]

* Power consumption of QMB [6]

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.

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. [7]
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
You can adjust the screen brightness twice a day by specifying the time. [18]

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.

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.

Our eco-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 and releasing drawings of props.[19]

* Package design that dramatically reduces ink usage
Endnotes

Disclaimer

1. 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: QM50B, QM55B, QM65B, QM75B

2. 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: QM50B, QM55B, QM65B, QM75B

3. 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 3.91, Korea LCI DB, EU Electricity Emission Factors 2022 (IEA)

4. 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

5. It was based on the greenhouse gas equivalence calculation guide provided by the U.S. EPA
   - 1 kg CO₂eq is equivalent to the amount of 2.482 miles operated by gasoline car (source: U.S. EPA)

6. 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
   - QMB rear cover: contains a minimum of 10% recycled polycarbonate(PC) (based on weight)

7. 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

8. Product Environment Management Substances Operation Rules
Endnotes

9. Details of the conversion of renewable energy
Samsung Electronics joined RE100, a global initiative, to reduce carbon indirect emissions (Scope 2) caused by power use and decided to push for the conversion of renewable energy to used power by 2050. First, Samsung Electronics is pushing to achieve its renewable energy target at all overseas operations within five years. The U.S., China and Europe, which have already achieved their renewable energy goals, have decided to expand their renewable energy supply contracts (PPAs) that are signed directly with renewable energy generation operators. The DX division is pushing 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.

10. Samsung Electronics adopts global standards such as environmental management (ISO14001) and energy management system (ISO5001), 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.

11. 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.

12. The recycled materials applied to the product packaging materials are as follows.
- Packaging Materials Containing 50% Recycled Plastics: Accessories Bag, PP Band

13. We no longer use plastic tape for box sealing and changed to paper tape, which is applied separately as shown in the table below according to the product size.

<table>
<thead>
<tr>
<th></th>
<th>55”</th>
<th>46”~ 65”</th>
<th>75”~</th>
</tr>
</thead>
<tbody>
<tr>
<td>All in one box</td>
<td>Upper/lower detachable box</td>
<td>Upper/lower detachable box</td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>After (second half of 2023~)</td>
<td>Changes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Tape material change (Plastic → Paper)</td>
<td>- No longer apply Top Plastic Tape</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- No longer apply Top Plastic Tape</td>
<td>- Adding a central PP band</td>
<td></td>
</tr>
</tbody>
</table>

14. 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.

15. 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

16. Typical power consumption of QMB

<table>
<thead>
<tr>
<th>Model (Inch)</th>
<th>QM43B (43&quot;)</th>
<th>QM50B (50&quot;)</th>
<th>QM55B (55&quot;)</th>
<th>QM65B (65&quot;)</th>
<th>QM75B (75&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average power consumption</td>
<td>79 W</td>
<td>91 W</td>
<td>108 W</td>
<td>127 W</td>
<td>161 W</td>
</tr>
</tbody>
</table>

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 '22 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.

17. 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. (It may vary by country)

18. Approximately 59% of energy can be saved under the following usage condition: 8:00 a.m. - 6:00 p.m. (Daytime); 400 nit; 6:00 p.m. - 8:00 a.m. (Nighttime); 110 nit (based on 400 nit 106 W, 110 nit 43.8 W). * Tested under internal laboratory condition for LH55QMEBGXCEN

19. Providing drawings for eco-package production props
https://www.samsung-ecopackage.com

Recycling
Samsung established waste collection systems in each region as we work tirelessly to enhance the collection and recycling of waste products. We also offer product take-back and recycling services for Samsung products in countries with local take-back legislation. We are always looking to expand to additional locations.

Eco-Management
Samsung Electronics set the foundation for eco-management as a philosophy for the 21st century through the commitments made in the Samsung Environmental regulations and laws. We have put eco-management into action and are leading the way to a sustainable future by offering our customers eco-friendly products. We believe a healthy environment is essential to the future of society.

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.
Appendix. ENERGY STAR

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, 16677, Republic of Korea

for the following products:
Displays
Brand: SAMSUNG
Model: See Appendix A

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

Certificate Date: 2022-01-19

Issued by: 479028909

UL Certificate Name

Appendix A

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Model Number</th>
<th>Family Models</th>
<th>Additional Identifying Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>QM68B</td>
<td>QM88B</td>
<td>LHSSQMEB6GX**</td>
<td>* can be any alphanumeric character</td>
</tr>
</tbody>
</table>
Declaration of RoHS Compliance for QMB SERIES

Samsung Electronics Co. Ltd (the “Company”) hereby declares that QMB 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.

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: YongSup LEE
Global Customer Satisfaction Team

Date: 2023-04-17

Name: YONGSUP LEE
Job position/Title: CL3/Product Quality Group

¹ http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm
Declaration of REACH Substances of Very High Concern (SVHCs) Disclosure

Model: QMB

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.

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS No.</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>ASSY PCB MAIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASSY ACCESSORY</td>
</tr>
<tr>
<td>Boric acid, crude natural</td>
<td>11113-50-1</td>
<td>ASSY OPENCELL</td>
</tr>
</tbody>
</table>

Signature: [Signature Image]  
Date: 2022-04-10

Name : YONGSUP LEE  
Job position/Title : CL3/Product Quality Group

---


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

3 The latest revision to the candidate list was published by the European Chemicals Agency on 17th January 2022 at: [https://echa.europa.eu/candidate-list-table](https://echa.europa.eu/candidate-list-table)

4 Reference: ECHA Guidance on requirements for substances in Articles.
Appendix. 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: [Signature]
Date: Feb 14, 2022

Youngjin SUH
Vice President/Head of Products Environment Team
Global CS Center
SAMSUNG Electronics Co., Ltd.