

Lotte Staron & Radianz Sustainability report

EVERY
STEP FOR
GREEN



Sustainability

LOTTE Chemical strives to fulfill its corporate economic, social and environmental responsibilities and to move toward a sustainable tomorrow by protecting the one and only planet Earth.

Sustainability Management System



Compliance Management

Operation of the compliance system by building global-level compliance infrastructure



Ethical Management

Establishment of a transparent, fair, and rational management culture



Environmental Safety Management

Investment in eco-friendly equipment and product development and strengthening of preemptive safety and health management system



Social Contribution

Improvement of corporate image and reputation by carrying out strategic community contribution programs



Mutual Growth

Establishment of fair trade practice and support for the strengthening of the partner companies' competitiveness

Implementation of Sustainable Development Goals (SDGs)

Lotte Chemical is actively implementing the management strategy that conforms to the UN SDGs to fulfill its responsibility as a global corporate citizen.



Eco-friendly Management

LOTTE Chemical champions protecting the environment and will pursue ESG management to be reborn into a sustainable company that is respected by society.

GREEN PROMISE 2030



Net-Zero

Carbon Neutrality and Eco-Management

2050 Carbon neutrality (Net-Zero)
2030 Carbon-reduced growth (▲25%)

Join RE 100

Create green ecosystem



Circulation & Coexistence

Creating social values of circulation and coexistence

Resource Circulation
2030 Recycle Plastic > 1 million tons in sales

Product/supply chain management

Strengthening global health and safety



Green Innovation

Leading sustainable future industry

Leading the growth of the hydrogen ecosystem
Supply of 1.2 million tons of hydrogen by 2030

Expand battery material business
Advance lithium-ion batteries into the 4 core materials market

Enhance ESG competence and system

Strengthen human rights management / human resources

Digital ESG Management

Transparent and fair corporate culture / improvement of shareholder value

RESPONSE TO CLIMATE CHANGE

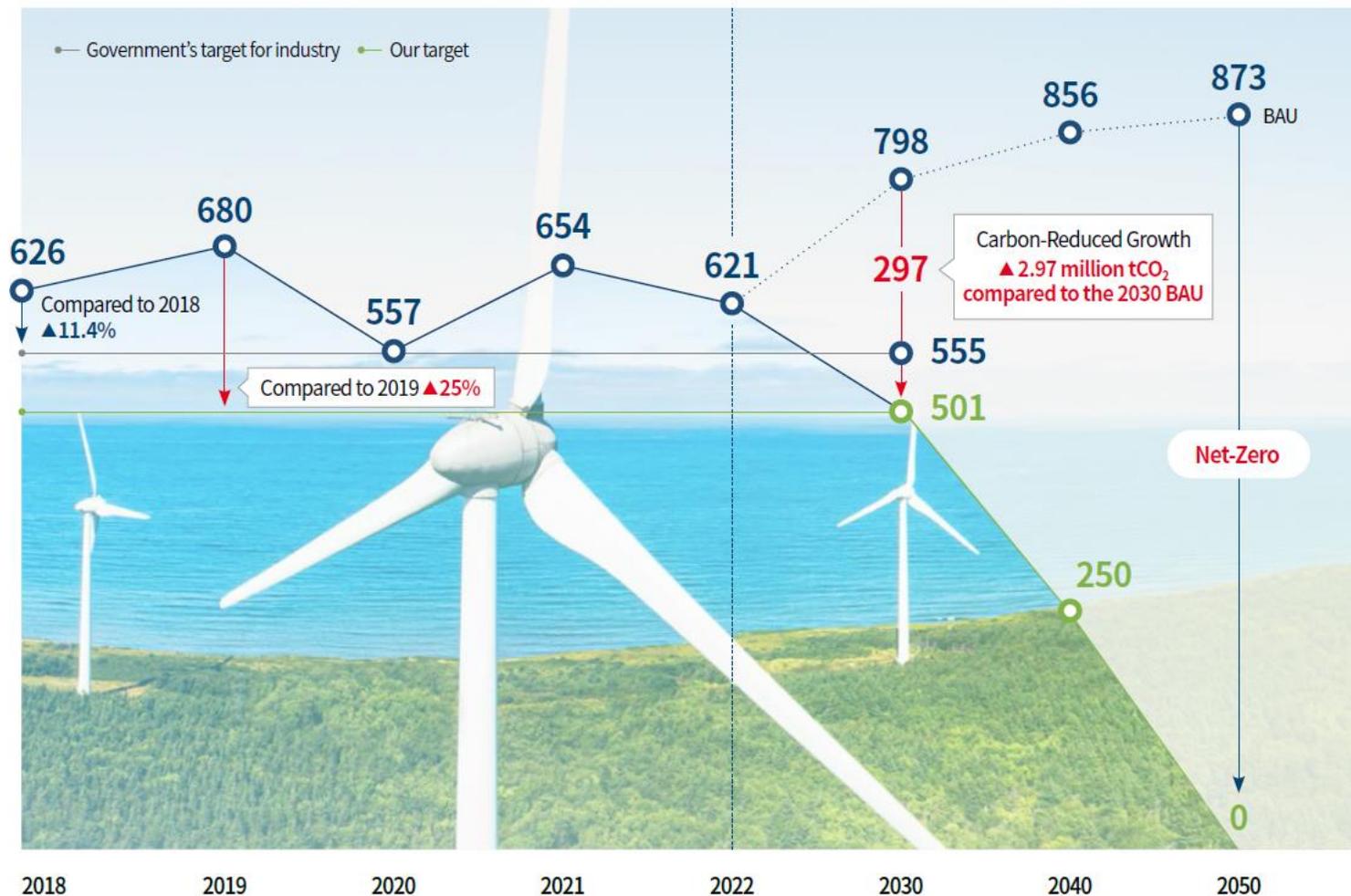
Our Goals, 2030 Carbon-Reduced Growth and 2050 Net-Zero

LOTTE Chemical has set a goal to mitigate its carbon emissions by 25% from its peak level of 6.8 million tons in 2019 by the 2030. This is higher than the government's industrial sector target of an 11.4% reduction from 2018 and represents a reduction of carbon emissions by 2.97 million tons compared to the BAU level (emissions without any reduction measures taken) of 7.98 million tons.

In the long term, LOTTE Chemical has set a target to curtail its carbon emissions by 8.73 million tons compared to the BAU level by 2050, and LOTTE Chemical intends to actively participate in the global efforts to combat climate change.

LOTTE Chemical Net-Zero Plan

(Unit: 10,000 tCO₂)

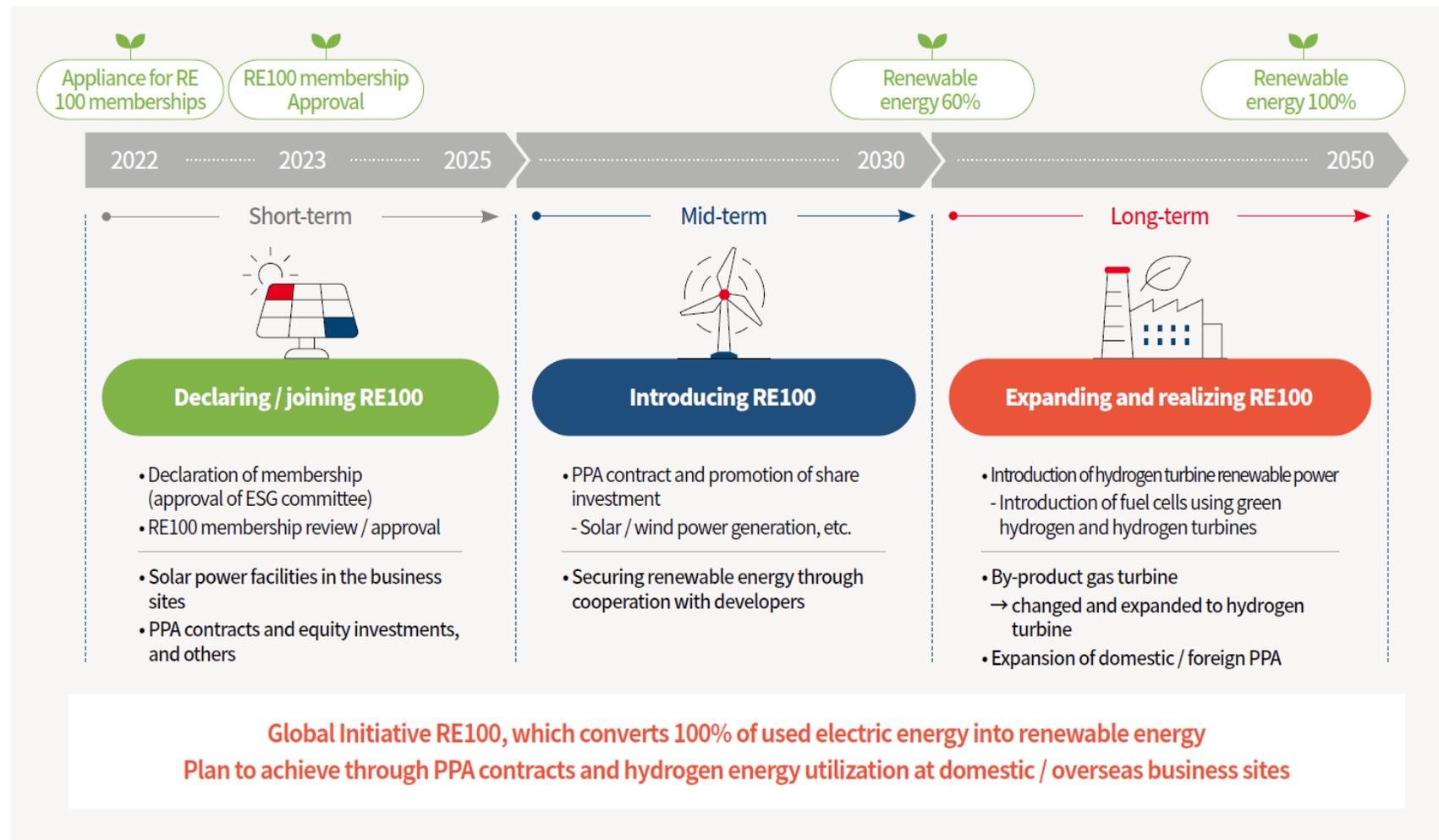


Introduction of New Renewable Energy

RE100 Roadmap Refinement

LOTTE Chemical signed up for Global Initiative RE100 in 2023, one of the 20 strategic tasks to achieve Green Promise 2030. Accordingly, we intend to increase the use of renewable energy, such as solar and wind power to 60% of all domestic and overseas business sites by 2030. By 2050, we will convert our energy usage to 100% renewable energy through the introduction of fuel cells and power generation facilities using green hydrogen. We plan to secure Power Purchasing Agreements (PPAs) and Renewable Energy Certificates (RECs) for domestic business sites and at the same time, seek to introduce renewable energy to each overseas business site.

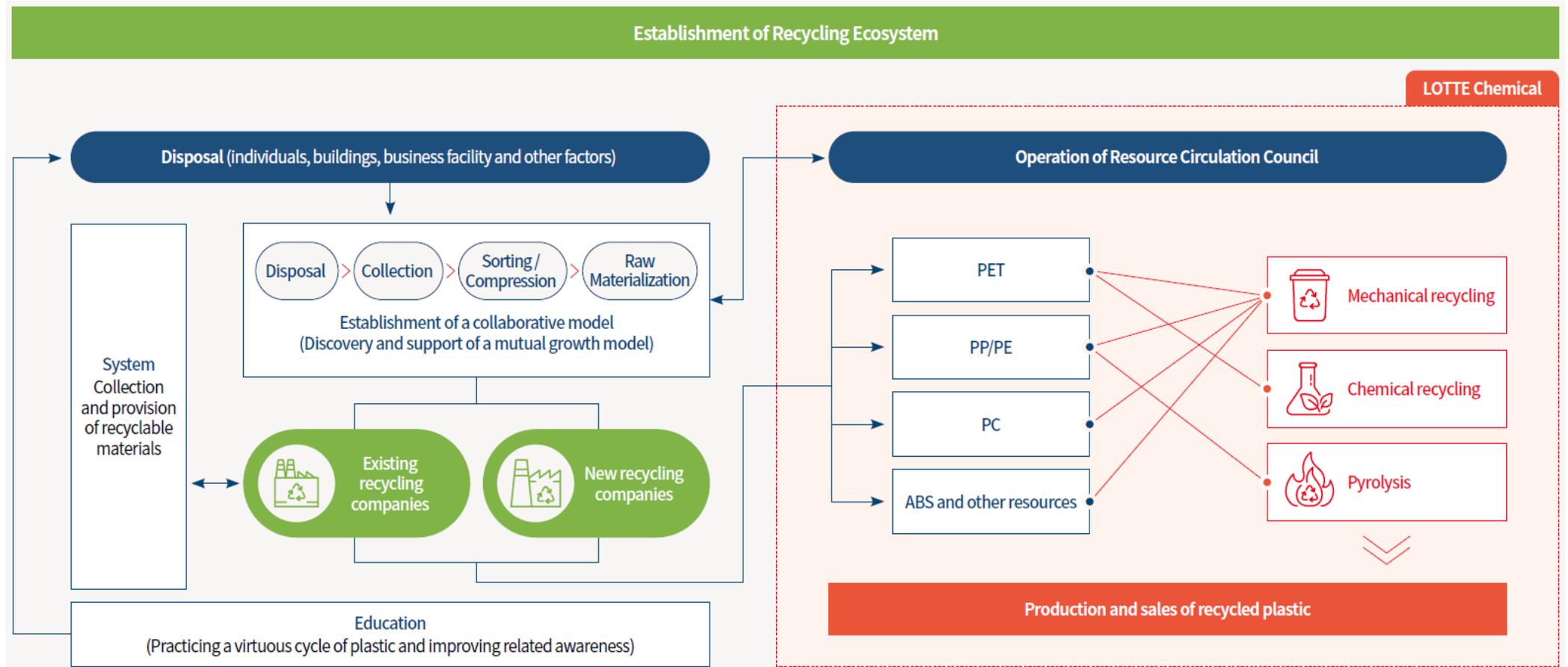
RE100 Roadmap of LOTTE Chemical



RESOURCE CIRCULATION

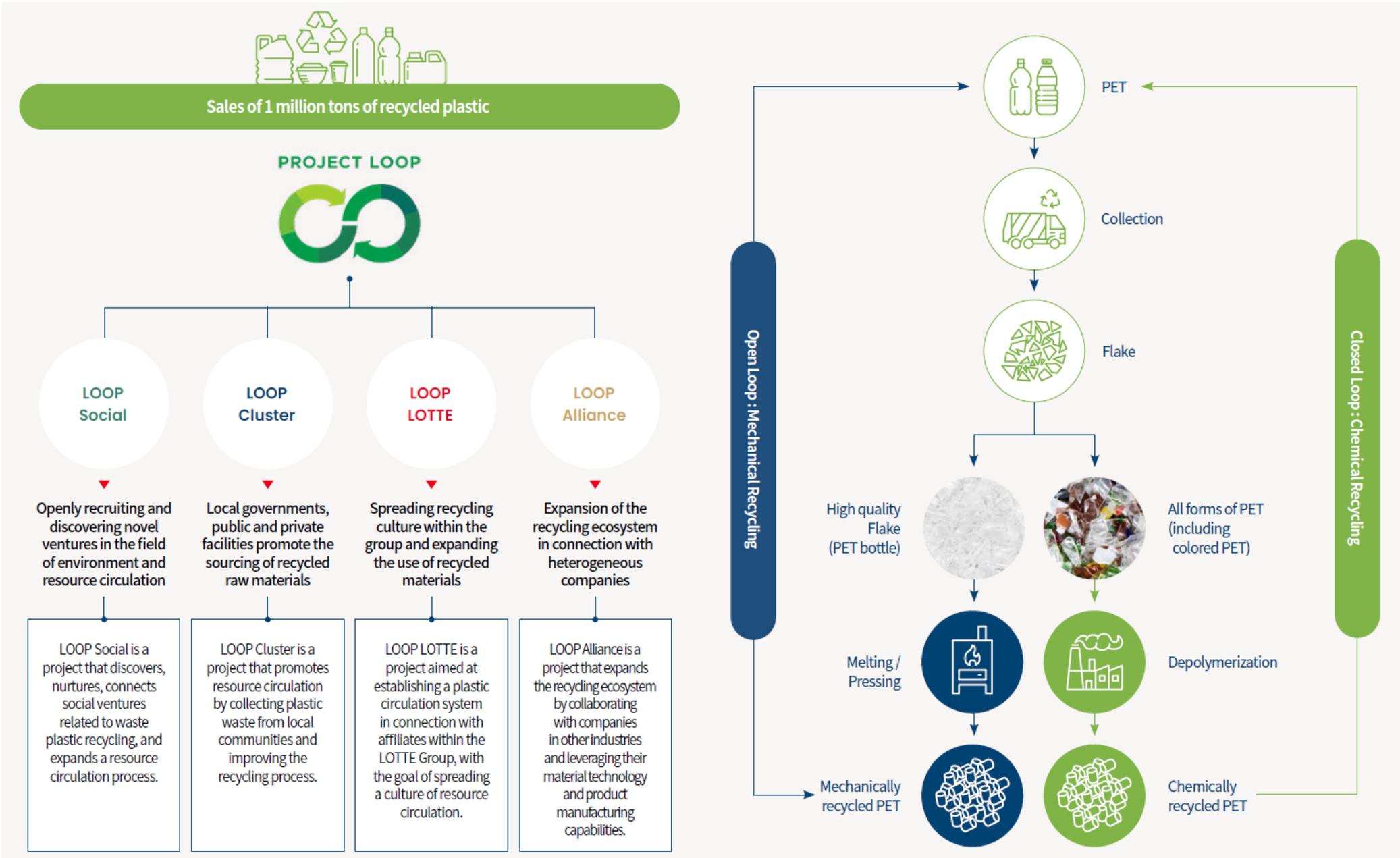
Our Efforts for Resource Circulation

The key to reducing the continuously increasing amount of plastic waste, conserving the earth's resources, and maintaining the quality of life lies in enhancing mechanical recycling and expediting the commercialization of chemical technologies by establishing a platform for plastic resource circulation. For sustainable business operation and growth, LOTTE Chemical will systematically create a sustainable plastic cycle by providing necessary systems and education and interconnecting plastic recycling processes and stakeholders. These efforts will be made by establishing a resource circulation platform.



RESOURCE CIRCULATION

Recycling Plastic Projects Implementation Strategy



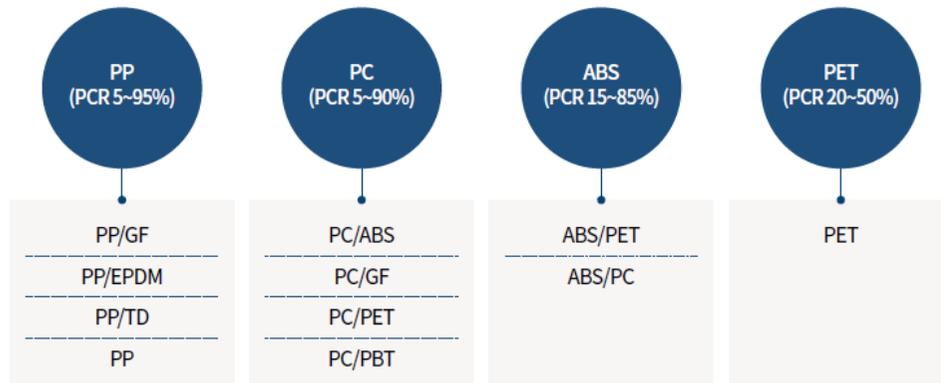
Expansion of Green Products

Mechanical Recycling

It is a recycling process that involves collecting used products, sorting plastic products by type, crushing them, and reintroducing them into the production process.

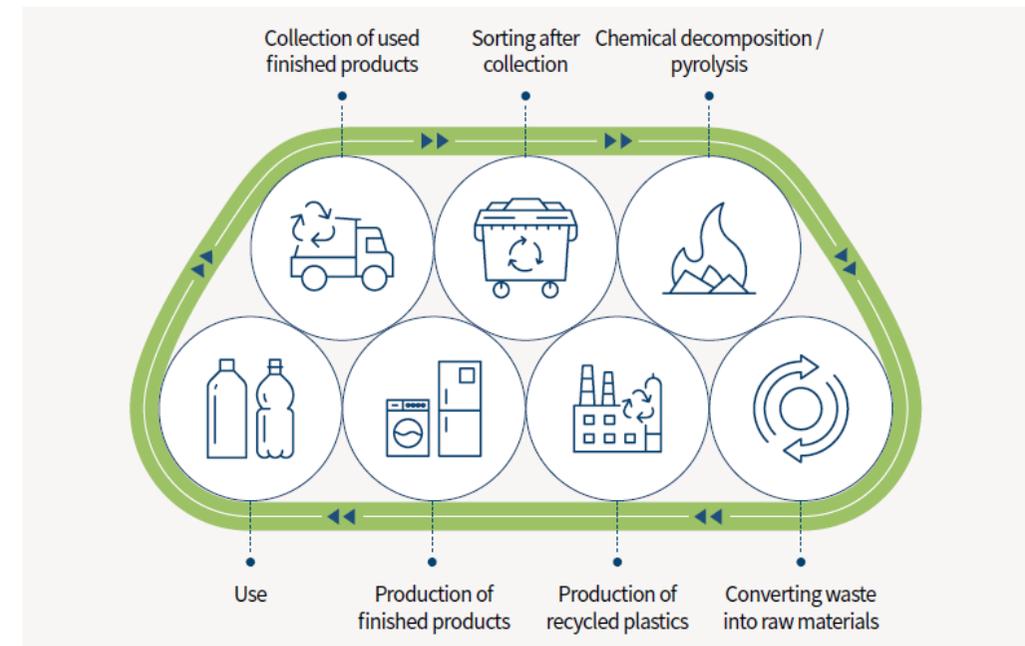


Product Lineups

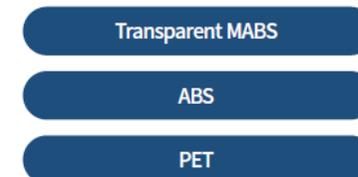


Chemical Recycling

The chemical recycling process is a recycling process that involves the chemical pyrolysis of spent products or byproducts from the process into raw materials for regeneration. Chemical recycling can utilize all flake raw materials, including colored flakes, and has the advantage of being applicable in a wide range of products, including food products.



Product Lineups



Applications



Expansion of Green Products

Recycling Collected Marine Plastic

As part of marine environmental protection, this solution is re-introducing plastic waste collected from the coastal areas, just before it enters the deep sea, into the recycling process.

Product Lineups	Applications
ABS/PET(OBP* 5%)	
PC(OBP 10~50%)	
PA/GF(OBP 30%)	

*OBP : Ocean Bound Plastic

E&E(Electronic Equipment)

Staron and Radiaz Recycled Products

Staron contains 6%, and Radiaz contains 5 to 29% of recycled material and is certified by SCS.

Lotte will continue to expand its eco-friendly products.

Staron

No	2023 Staron SCS Colors	Certificate No	Certificate %
1	Solid Universe(N)	SCS-RC-06254	6%
2	Solid Bliss	SCS-RC-06254	6%
3	Solid Sunflower(N)	SCS-RC-06254	6%
4	Solid Pure White(S)	SCS-RC-09257	6%

Radiaz

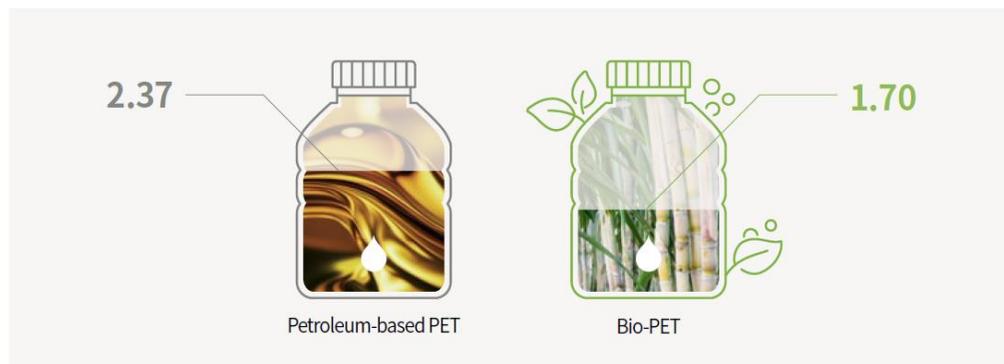
No	2023 Radiaz SCS Colors	Certificate No	Certificate %
1	Gentle Gray	SCS-RC-01955	29%
2	Elbrus Boulder	SCS-RC-02332	22%
3	Mont Blanc Snow	SCS-RC-02332	22%
4	Imperial Gray	SCS-RC-02656	12%
5	Sierra Bedrock	SCS-RC-02656	9%
6	Whistler Mocha Gray	SCS-RC-02656	9%
7	Saltoro Cliff	SCS-RC-02656	9%
8	Mariposa Buff	SCS-RC-02655	5%

Bio-PET

LOTTE Chemical's Bio-PET product is produced using Bio-MEG extracted from sugarcane as a raw material, resulting in lower carbon dioxide emissions compared to petrochemical-based PET.

LCA (Life Cycle Assessment) Assessment / CO₂ Emission

(Unit: kg CO₂/kg PET)



MINIMUM 6% RECYCLED CONTENT
PRE-CONSUMER



MINIMUM 29% RECYCLED CONTENT
PRE-CONSUMER



MINIMUM 22% RECYCLED CONTENT
PRE-CONSUMER



MINIMUM 12% RECYCLED CONTENT
PRE-CONSUMER

Transparency

Lotte Staron and Radianz have various certifications regarding transparency.

Each certification is available at www.staron.com → Staron → Technical Information → Documentation → Sustainability and Certification
www.staron.com → Radianz → Technical Information → Documentation → Sustainability and Certification

UL Greenguard Certification

: GREENGUARD Gold certified products are low-emitting and contribute to cleaner indoor air.

NSF / ANSI 51 Certification

: NSF certification proves that the product complies with food safety regulations and is free of harmful chemicals.

BREEAM

: BREEAM is an assessment label for the sustainability performance of buildings.

Environmental Product Declaration (EPDs) Certification

: EPD provides information about a product's impact on the environment, from material to production, shipping, consumption and disposal.

Health Product Declaration (HPD) Certification

: HPD provides product contents and associated health information to create healthier buildings.



SCS Recycled Content Certification

SCS Recycled Content Certification independently verifies the percentage of a product that was made from recycled content or recycled materials. This certification is for product manufacturers that use post-consumer or pre-consumer recycled content and want to make a verified claim.



MINIMUM 6% RECYCLED CONTENT
PRE-CONSUMER



MINIMUM 29% RECYCLED CONTENT
PRE-CONSUMER

2023 Renewal Recycled Content Certification Assessment Report

LOTTE Chemical Corp.

Songpa-gu, Seoul, South Korea

Solid Surfaces:

Radianz® Quartz Surfaces and Staron® Solid Surfaces

August 11, 2023



UL Greenguard Certification

GREENGUARD Gold Certified products are low-emitting and contribute to cleaner indoor air for you and your family. Certified products are screened for more than 15,000 VOCs known to pollute indoor air. (*VOC : volatile organic compounds)

CERTIFICATE OF COMPLIANCE



**LOTTE CHEMICAL
CORPORATION**

Staron® solid surface sheets

4109-420

Certificate Number

18 Sep 2007 - 18 Sep 2024

Certificate Period

Certified

Status

UL 2818 - 2022 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Building products and interior finishes are determined compliant in accordance with California Department of Public Health (CDPH) Standard Method V1.2-2017 using an Office and Classroom Environment.
Product tested in accordance with UL 2821 test method to show compliance to emission limits on UL 2818. Section 7.1 and 7.2.



UL investigated representative samples of the identified Product(s) to the identified Standard(s) or other requirements in accordance with the agreements and any applicable program service terms in place between UL and the Certificate Holder (collectively "Agreement"). The Certificate Holder is authorized to use the UL Mark for the identified Product(s) manufactured at the production site(s) covered by the UL Test Report, in accordance with the terms of the Agreement. This Certificate is valid for the identified dates unless there is non-compliance with the Agreement.

NSF / ANSI 51 Certification

NSF certification proves that Staron and Radianz comply with food safety regulations and they are free of harmful chemicals.

NSF International

789 N. Dixboro Road, Ann Arbor, MI 48105 USA

RECOGNIZES

Lotte Chemical Corporation

Korea, Republic of

AS COMPLYING WITH NSF/ANSI 51 AND ALL APPLICABLE REQUIREMENTS.
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK.



ISO/IEC 17065
Product Certification Body
#0218
Certification Program
Accredited by the
American National
Standards Institute



Certification Program
Accredited by the
Standards Council
of Canada

This certificate is the property of NSF International and must be returned upon request. This certificate remains valid as long as this client has products in NSF's Official Listings for the referenced standards. For the most current and complete Listing information, please access NSF's website (www.nsf.org).

A handwritten signature in black ink, appearing to read "S Krol", is written over a horizontal line.

December 10, 2019
Certificate# 33690 - 04

Sarah Krol
Global Managing Director, Food Safety Product Certification

BREEAM

BREEAM is an assessment label of the sustainability performance of individual buildings, communities and infrastructure projects originated in the United Kingdom.

The test results indicate that Staron qualifies for the BREEAM specifications on VOC emissions and VOC content.

(*VOC : volatile organic compounds)



Attestation

BREEAM®

On, 13 January 2022 Eurofins Product Testing A/S received a sample of a panel with the product name:

STARON

supplied by

LOTTE CHEMICAL DEUTSCHLAND GMBH

The sample was supplied as being representative of the manufactured product, and it has been tested as in accordance with the relevant EN 16516, ISO 16000-3, ISO 16000-6, ISO 16000-9, and ISO 16000-11 testing standards (See test report no. 392-2022-00013701_V_EN).

The test results of the tested sample indicate that the product qualifies for the below mentioned BREEAM specifications on VOC emissions and VOC content by complying with:

- **BREEAM® International: Compliance with Exemplary criteria on VOC emission of BREEAM International: New Construction 2021, Technical Manual – SD250: Hea 02 Indoor Air Quality (version 6.0. of December 2021).**

3 March 2022


Laura Hartung Sørensen
Analytical Service Manager


Rasmus Verdier
Analytical Service Manager

Environmental Product Declaration (EPDs) Certification

The EPD provides information to buyers about a product's impact on the environment, such as global warming potential, smog creation, ozone depletion and water pollution.

An EPD is a summary of the lifecycle assessment (LCA) for a product from material extraction to production, shipping, consumption and disposal. The LCA is developed according to Product Category Rules (PCRs) — product-specific calculation requirements and methodologies that helps ensure consistent data collection and analysis during LCA creation.



Environmental Product Declaration

LOTTE Chemical |
Staron® Acrylic Solid Surfaces



Declaration Owner

LOTTE Chemical
56 Gosan-ro, Uiwang-si, Gyeonggi-do
Republic of Korea
+82-31-596-3819
staron.us@lottechem.com
www.staron.com

Products

Staron® Acrylic Solid Surfaces

Functional Unit

The functional unit is one square meter of countertop provided and maintained for a period of 10 years in residential use.

EPD Number and Period of Validity

SCS-EPD-08793
EPD Valid March 31, 2023 through March 30, 2028
Version: April 13, 2023

Product Category Rule

Product Category Rule for Environmental Product Declarations:
PCR for Residential Countertops. NSF International. Valid through
March 31, 2023

Program Operator

SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608
+1.510.452.8000 | www.SCSglobalServices.com



Health Product Declaration (HPD) Certification

The HPD Open Standard, developed by HPDC, provides a standardized format for manufacturers to disclose product contents and associated health information, empowering stakeholders to create healthier buildings.

Architects and building owners can use the HPD to help products contribute more toward LEED or WELL qualification.

Staron® Acrylic Solid Surfaces by Lotte Chemical Corp.

Health Product Declaration v2.3

created via: HPDC Online Builder

HPD UNIQUE IDENTIFIER: 90647640064

CLASSIFICATION: 12 36 61.16 Solid Surfacing Countertops

PRODUCT DESCRIPTION: Staron® is a homogeneous and non-porous acrylic composite surfacing material well-suited for a range of interior applications. Designed with active end-users in mind, Staron® offers an extensive assortment of colors and patterns to complement virtually any decor space. From subtle neutrals to vivid solids, Staron® is an ideal surfacing solution for healthcare, hospitality, corporate and retail environments. Manufacturer of Staron®, Lotte Chemical, is committed to be the "Green Movement" and is constantly striving to improve the environment and keep our nature pristine. There are no heavy metals or toxic chemicals used in the production of Staron®. All suppliers of the raw materials used in the manufacture of Staron® are supervised under a strict Lotte quality control program.

Section 1: Summary

Basic Method / Product Threshold

CONTENT INVENTORY

Inventory Reporting Format	Threshold Level	Residuals/Impurities Evaluation	<i>For all contents above the threshold, the manufacturer has:</i>
<input type="radio"/> Nested Materials Method	<input type="radio"/> 100 ppm	<input checked="" type="radio"/> Completed	Characterized <input checked="" type="radio"/> Yes <input type="radio"/> No
<input checked="" type="radio"/> Basic Method	<input checked="" type="radio"/> 1,000 ppm	<input type="radio"/> Partially Completed	<i>Provided weight and role.</i>
Threshold Disclosed Per	<input type="radio"/> Per GHS SDS	<input type="radio"/> Not Completed	Screened <input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="radio"/> Material	<input type="radio"/> Other	Explanation(s) provided :	<i>Provided screening results using HPDC-approved methods.</i>
<input checked="" type="radio"/> Product		<input checked="" type="radio"/> Yes <input type="radio"/> No	Identified <input type="radio"/> Yes <input checked="" type="radio"/> No
			<i>Provided name and CAS RN or other identifier.</i>

Management System

Lotte Staron and Radianz have ISO certifications regarding its management systems.

Each certification is available at www.staron.com → Staron → Technical Information → Documentation → Sustainability and Certification
www.staron.com → Radianz → Technical Information → Documentation → Sustainability and Certification

ISO 14001

: ISO 14001 is an international standard for environmental management systems (EMS).

ISO 50001

: ISO 50001 is an international standard that is awarded for an effective energy management system.

ISO 45001

: ISO 45001 is an international standard that specifies requirements for an occupational health and safety (OH&S) management system.

ISO 9001

: ISO 9001 is a globally recognized standard for quality management.



ISO 14001

Environmental management

ISO 50001

Energy management

ISO 45001

Occupational health and safety management

ISO 14001 is an international standard for environmental management systems (EMS). It provides a framework for organizations to take proactive measures to minimize their environmental footprint, comply with relevant legal requirements, and achieve their environmental objectives.

ISO 50001 is an international standard that is awarded when a company can demonstrate an effective energy management system. It is geared towards businesses who have committed to disclosing and reducing their emissions, and who are dedicated to developing a policy to make their operations more energy efficient.

ISO 45001 is an international standard that specifies requirements for an occupational health and safety (OH&S) management system. This standard aims to reduce occupational injuries and diseases, promoting and safeguarding both physical and mental health in the workplace.



CERTIFICATE

Certificate Number: EAC-0687501

LOTTE CHEMICAL CORP. Advanced Materials

• Yeosu Plant : 334-27, Yeosusandan-ro, Yeosu-si, Jeollanam-do, Korea (Zip code : 59616)

Korean Foundation for Quality certifies that the above organization has complied with the following standard requirements.

ISO 14001:2015/KS I ISO 14001:2015

Scope of certification

• Yeosu Plant : Design & Development, Production and Servicing of ABS (Acrylonitrile Butadiene Styrene), ASA (Acrylate Styrene Acrylonitrile), PS (Poly Styrene), SAN (Styrene Acrylonitrile), EPS (Expandable Poly Styrene), LD (Light Diffuser), EP (Engineering Plastics), SS (Solid Surface), S&B (Sink & Bowl), PC (Poly Carbonate) and Engineered Stone (Quartz Surface)

Registration Date 2022-07-28
Initial Certification Date 2018-07-18

Expiration Date 2025-07-27
Revision Date 2022-07-22



KAB-EC-01

KFQ has been accredited in respect of ISO 14001 covered by the KAB (Accreditation Certificate Number KAB-EC-01)

Ji Young Song

Ji Young Song
President & CEO of KFQ

한국품질재단

www.kfq.or.kr
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