

GRAFTON[®]

GRAFTON Company Overview

Functional Materials for Air Quality Control

Molecular-level technology for reducing odors and hazardous substances at the source

GRAFTON Co., Ltd.

Market Background | Growing Awareness of Air Quality

Residential Spaces | Care Facilities | Vehicle Interiors

- Limitations of conventional approaches (condition-dependent, with re-emission issues)
- Odor challenges increasing in aging societies
- Growing health awareness
- Growing demand for self-solutions via e-commerce
- Increase in product-specific search demand
- Increasing demand for high-performance solutions

**Air Quality
Issues**

From unnoticed issues to active solutions
From sensory perception to chemical
risk awareness

Functional materials that act on and transform target molecules

Molecular-level control of odors, VOCs, and hazardous substances

Air Quality Solutions	General odor control	Healthcare & Elderly Care	Specialized Applications
◆ Formaldehyde	◆ Comprehensive Odor Control	◆ Malignant wound odor	◆ Decomposition / post-mortem odors
◆ Acetaldehyde	◆ Pet Odor	◆ Care-related odors (urine, fecal)	◆ Fire / smoke odors
◆ VOC-related odors (e.g., benzene, toluene)	◆ Tobacco Odor	◆ Axillary odor	◆ Rubber odor
	◆ Food waste / toilet odors		◆ Mold odor control / growth prevention
	◆ Menstrual odor		◆ High-temperature odor control (e.g., sauna rooms)
	◆ Footwear odor		
	◆ Aging-related odor		

Custom design and formulation for specific applications

GRAFTON | Functional Materials for Molecular Transformation



GRAFTON

- Molecular transformation
- Acts at the source
- No re-emission

Conventional Approaches

- Temporary masking
- Recurs over time
- Condition-dependent

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- ◆ Directly transforms target molecules at the source
 - ◆ Not a temporary fix — addresses the source

Products Optimized by Application

Functional materials tailored to specific applications

■ Air Quality Improvement

(Chemical Substance Control)

Reduction of hazardous substances
(*GGA Series*)

- Formaldehyde / VOC reduction
- Residential / furniture / in-vehicle applications
- Spraying / coating / material integration

■ Everyday Odor Control

(Comprehensive Odor Management)

General odor control for daily environments
(*LLST Series*)

- Pet / tobacco / household odors
- Indoor spaces / textiles / facilities
- Spray / on-site application

■ Healthcare & Elderly Care

(High-Intensity Odor Control)

For high-intensity odor control in care environments

(*LLST Medical Line*)

- Urine / fecal / body / wound odors
- Care facilities / medical environments
- Continuous use / professional applications

■ Specialized Applications

(High-Difficulty Environments)

For complex and high-intensity odor environments

(*LLST Advanced Line*)

- Decomposition / fire and smoke / industrial odors
- Specialized cleaning / industrial applications
- High-concentration / complex environments

Custom design available (OEM / joint development)

Track Record | Proven in Real-World Use

Proven in real-world environments



■ Housing & Building Materials

Adopted for indoor air quality improvement

- Used by major housing and building materials manufacturers
- Applied for formaldehyde and VOC control
- Used in new construction and renovation projects



■ Overseas & General Consumer Market

Large-scale deployment (1M+ households in China)

- Proven through e-commerce channels
- Continued use driven by repeat purchases
- Used in everyday living environments



■ Public, Research & Specialized Environments

Used in extreme environments

- Proven use in Antarctic research stations
- Stable performance in enclosed and long-term environments
- No re-emission performance confirmed

Continuous use | Proven long-term performance | High repeat adoption

Product Lineup ① | Air Quality & Odor Control at the Source

Molecular-level control of target substances

■ Air Quality Improvement (Chemical Control) For formaldehyde and VOC reduction

Product Name	Form	Primary Application	Features	Application Method
SFXN-111-S6R	Liquid	Formaldehyde	Molecular-level adsorption with no re-emission / Standard industrial grade	Coating / Spray
FXN-111-S6S	Liquid	Formaldehyde	Molecular-level adsorption with no re-emission / High-performance (high functional density)	Coating / Spray
FXN-111-S6-8	Liquid	Formaldehyde	Molecular-level adsorption with no re-emission / Designed for painted surfaces	Coating / Spray
GGA-5	Liquid	Formaldehyde	Molecular-level adsorption with no re-emission / Latest formulation with excellent handling	Coating / Spray
GGA-5-CT	Liquid	Formaldehyde	Coating-compatible formulation	Coating / Spray
GGA-5LAD	Liquid	Formaldehyde	Enhanced low-concentration performance (advanced model)	Coating / Spray
GGG-BTXS	Liquid	Benzene / Toluene	Effective for benzene and toluene	Coating
GGG-BTXS-CT	Liquid	Benzene / Toluene	Coating-compatible formulation	Coating
SuppliGel H	Gel	Formaldehyde	Localized treatment	Placement

■ Everyday Odor Control (Comprehensive) For general indoor and household odors

Product Name	Form	Primary Application	Features	Application Method
LLST-5	Liquid	General household odors	General-purpose odor control	Spray
LLST-5NW	Liquid	Pet odors	Low-irritation formulation	Spray
ZDS-100	Liquid	High-temperature odors	Stable performance at high temperatures	Spray
LLST-525	Liquid	Food waste / toilet odors	Specialized for thiol odors	Spray
LLST-TOB	Liquid	Tobacco odors	Optimized for tobacco odor control	Spray
LLST-PTS	Liquid	Fecal / urine odors	Specialized for waste-related odors	Spray
LLST-PTS+5-28	Liquid	Fecal / urine odors (care facilities)	Multi-odor control (daily/professional)	Spray
SuppliGel S	Gel	General household odors	Localized odor control (long-lasting)	Placement

Product Lineup ② | Medical & Specialized Applications

For high-intensity and specialized applications

■ Medical & Personal Applications (High-Intensity Odor Control) For biological and body-related odors

Product Name	Form	Primary Application	Features	Application Method
LLST-130, 210	Liquid	Malignant wound odor	Molecular-level odor control	Spray
LLST-5C	Liquid	Aging-related odor (nonenal)	Target-specific formulation	Spray
DDS-100Plus	Liquid	Biological odors	Targeted deodorization	Spray
DDS-100	Liquid	Biological odors	Minimizes re-emission	Spray
DDS-101	Liquid	Biological odors (fabric)	Effective for embedded odors	Spray
LLST-025	Liquid	Footwear odors	Specialized for footwear odors	Spray
LLST-085	Liquid	Food / spice odors	Effective for persistent odors	Spray
LLST-AAZ-P	Liquid	Body odor (professional)	Skin-compatible formulation	Spray
LLST-AAZ	Liquid	Body odor	Optimized for body odor control	Spray

■ Mold & Environmental Control

Product Name	Form	Primary Application	Features	Application Method
LLST-EMO	Liquid	Indoor deodorization	General indoor odor control	Coating
LLST-EMO-X	Liquid	Bathroom odor control	High-humidity performance	Spray

■ Specialized Applications (Extreme Environments) For high-intensity and complex odor conditions

Product Name	Form	Primary Application	Features	Application Method
LLST-100, 200	Liquid	Decomposition odors	High-performance for complex compounds	Coating / spray
LLST-220	Liquid	Fire / smoke odors	Suppresses re-emission	Spray
LLST-OT	Liquid	Rubber / industrial odors	Effective for difficult odors	Coating / spray
LLST-OT-WALL	Liquid	Wall contamination (rubber odors)	Designed for surfaces	Coating / spray

Where these challenges arise and who is affected

Air quality challenges across diverse environments

Environment	Affected Users	Key Issues	Scope of Impact
Housing & Buildings	Residents / workers / managers	Indoor pollutants / chemicals	Living spaces / furniture odors / post-renovation issues
Healthcare & Nursing Care	Care staff / healthcare professionals	Urine / fecal / body odors	Persistent odors / operational burden
General Living Environments	Individuals / households / workplaces	Daily-life odors / recurring issues	Pet / tobacco / food / body odors
Specialized & Industrial Environments	Cleaning professionals / operators	Fire / decomposition / complex odors	Extreme environments / material contamination

For challenges beyond conventional solutions

Why GRAFTON | Key Differences from Conventional Approaches

Conventional Approaches (Symptom-Based)	GRAFTON (Molecular Transformation Approach)
Physical adsorption / decomposition / masking	Transforms odor and hazardous substances at the molecular level
Condition-dependent (may re-emit)	No re-emission
Reduces concentration only (source remains)	Eliminates source substances

Temporary solution

Ongoing emission



Root-cause solution

No re-emission

- Reduced complaints (odor / air quality)
- Reduced rework and repeat handling
- Cost optimization through long-term stability

Implementation Overview | Application Examples

■ Housing & Construction

👉 Air quality solutions for post-construction and renovation

- Pre-handover treatment
- Reduction of furniture and building material odors
- Chemical odor control after occupancy

■ Healthcare & Elderly Care

👉 Sustained reduction of high-intensity odors

- Addressing persistent odors beyond conventional solutions
- Urine, body, and wound odors
- Reduced recurrence and improved operational efficiency

■ Continuous control of everyday odors

👉 Everyday living environments

- Pet, tobacco, toilet, and lingering odors
- Odors absorbed into clothing and fabrics
- Reduced recurrence of recurring everyday odors

■ Specialized & Industrial Applications

👉 Addressing high-intensity and persistent odors

- Fire, decomposition-related, and industrial odors
- Removal of residual odors
- Reduced need for rework

■ Implementation Methods

👉 Easily implemented without modifying existing processes

● On-site application (spray / coating)

Pre-handover treatment for new construction and renovation / post-treatment for existing spaces

● Material integration (functionalization)

Incorporation into building materials, coatings, and resins (e.g., melamine) for formaldehyde control

● Equipment and product integration

Functionalization of filters, interior materials, and textile products

Delivering air quality solutions without re-emission across diverse environments

Track Record & Reliability

■ Proven Performance in Real-World Environments

- Adopted by major housing and building materials manufacturers
- Applied for formaldehyde and VOC control
- Used in new construction and renovation projects
- Demonstrated in Antarctic research stations
- Stable in enclosed and long-term environments
- No re-emission performance confirmed
- Adopted in over 1 million households (China)
- Proven through e-commerce channels
- High repeat usage rates

■ Key Benefits

- Reduced complaints (odor / air quality)
- Reduced rework and repeat handling
- **Optimized costs through long-term stability**
- Reduced stress in care environments

■ Implementation Examples

Case 1 (Residential)

- No odor complaints after move-in
- Continued adoption across properties

Case 2 (Nursing Facility)

- Reduced complaints from residents
- Lower staff workload

Case 3 (Household)

- Effective for previously difficult odors
- Continued use and repeat purchases

Company Profile

Registered Trademark: GRAFTON

•Major Public Presentations

- 2000** The Society of Indoor Environment, Japan:
Study on Performance Test Methods for Coating Materials for Indoor Environmental Improvement”
- 2000** Building Environment and Energy Conservation Organization (IBEC):
Full-scale RC structure testing – Reduction test of 38 types of gaseous substances
- 2001** The Society of Indoor Environment, Japan:
Study on Methods for Reducing Formaldehyde in Indoor Environments Using Graft-Polymer Adsorbents”
- 2002** U.S. Environmental Protection Agency – IAQ (Indoor Air Quality) World Conference:
• “Study on Methods for Reducing Formaldehyde in Indoor Environments Using Graft-Polymer Adsorbents”
- 2003** 21st Air Cleaning and Contamination Control Conference:
Study on Methods for Reducing Formaldehyde in Indoor Environments Using Graft-Polymer Adsorbent Materials”
- 2004** Architectural Institute of Japan – Academic Presentation:
Removal and Emission Control of VOCs Using Graft-Polymer Coating Materials”
- 2012** The Society of Indoor Environment, Japan:
Research on Formaldehyde-Adsorbing Wallpaper Utilizing Radiation-Induced Graft Polymerization Technology
- 2013** The Society of Indoor Environment, Japan:
Case Study of Multi-Unit Housing Construction Incorporating Formaldehyde Adsorbents with Health Risk Considerations
- 2014** SIAQ (International Society of Indoor Air Quality and Climate)
Indoor Air 2014 in Hong Kong: “Reduction of Indoor Air Concentration of Formaldehyde by Adsorptive Polymer for Preventing Long-Term Exposure Effects in Residences”

Company Profile

Company Name : GRAFTON Co., Ltd.

Representative Director : Taisuke Shindo

Established : May 2002

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Tel: +81-3-6413-4766

Fax: +81-3-6413-4737

Website : www.grafton-gr.com

Capital : JPY 70,000,000

Business Activities

- Research and development of organic polymer materials using radiation irradiation technology
- Manufacturing and sales of GRAFTON® chemical adsorption materials
- Planning, development, and sales of environmental solutions

Affiliated Organization : The Society of Indoor Environment, Japan
<http://www.siej.org/>

Overseas Exclusive Distribution Partners

Exclusive Distributor – Korea (January 14, 2010)

GRAFTON KOREA CO., LTD.

#16869, 2725-3 Yonggu-daero, Suji-gu, Yongin-si, Gyeonggi-do, Republic of Korea

Website: www.grafton.co.kr

Exclusive Sales Distributor – China (October 20, 2014)

XI'AN VINGO ENVIRONMENTAL SCIENCE AND TECHNOLOGY CO., LTD.

Room 1807, B Building, Greenland Linghai Plaza,
No. 1 Jin Ye Road, High-Tech Zone, Xi'an 710065, Shaanxi Province, China

Website: www.iquanfen.com

Exclusive Sales Distributor – Malaysia (June 27, 2017)

Freshair Industry Sdn Bhd

Lot 10478 (D7), Jalan Nenas,
Jalan Kampung Jawa, Batu 5, 42450 Klang, Selangor Darul Ehsan, Malaysia

Website: www.freshhome.com.my

Exclusive Sales Distributor – Taiwan (June 29, 2021)

Maio Healthy Air Company Ltd.

No. 250-1, Juguang Road, Wanhua District, Taipei City 108, Taiwan

Website: www.mha-eco.com

GRAFTON Product Development Policy

Grafton Corporation recognizes chemical exposure, including formaldehyde, in residential, educational, and healthcare environments as a critical social issue. Rather than providing temporary removal, we focus on suppressing re-emission and achieving long-term reduction in living environments through our chemical adsorption technology, ensuring safer spaces where people spend extended periods of time. With particular consideration for sensitive populations, including children, we are committed to developing products that contribute to extending healthy life expectancy. All of our products are designed based on this philosophy.

This technology is designed to immobilize harmful substances at the molecular level and suppress re-emission.

Formaldehyde has been confirmed as a carcinogen, with reported effects on neurodevelopment, allergies, and the respiratory system. Children are considered particularly vulnerable to its effects.

Source: U.S. Environmental Protection Agency (EPA, 2024)