

25

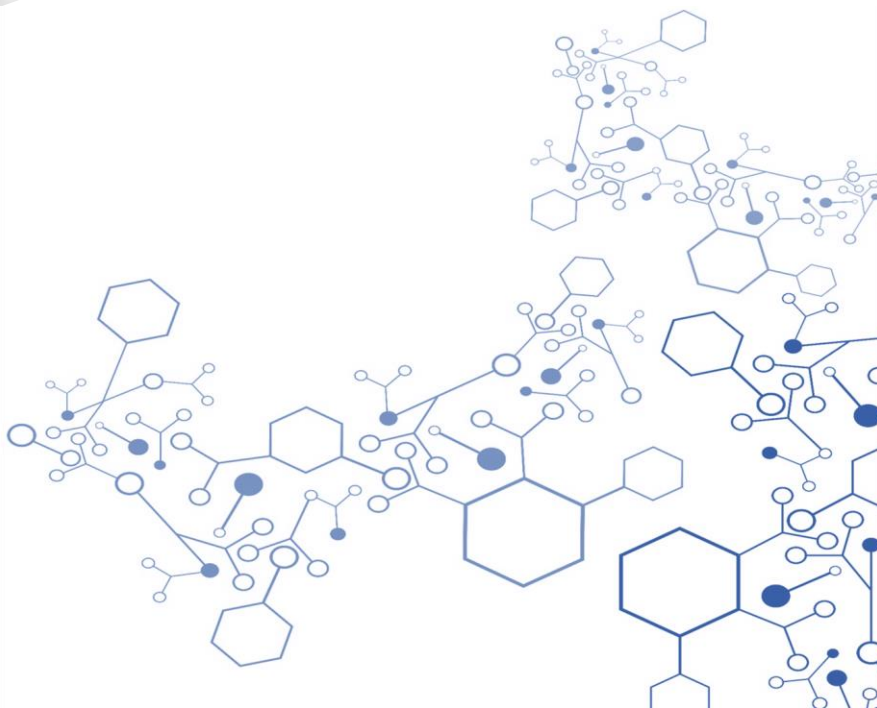
YEARS OF
MANUFACTURING &
CUSTOMIZING
ECO-FRIENDLY
VOLATILE CORROSION
INHIBITORS



JOHN & EUNDONG CO., LTD.
WWW.GREENVCI.COM

GREENVCI® GLOBAL SERVICES

Australia: X-Rust (GreenVCI AU)
China: China Eundong
Germany/EU: Safepack GreenVCI
Indonesia: Eco GreenVCI Indonesia
Korea: GreenVCI Polartech
Malaysia: GreenVCI Services
Mexico: GreenVCI Mexico
Thailand: GreenVCI Thailand
USA: Eundong (USA)





WHAT WE DO

We are an eco-friendly volatile corrosion inhibitors (VCI) raw material and industrial detergents manufacturer since 1994 with its forerunner company, Eundong International Inc.



WHAT WE SPECIALIZE

We specialize in manufacturing 100% no nitrite, 100% no amines, and food-grade VCI raw materials to help packaging, automotive, heavy machinery, oil & gas, remanufacturers, and other VCI companies achieve functional VCI excellence.



WHAT WE RESEARCH

Our research is not only allocated to the innovation of VCI, but also centralized to the application of VCI in new fields. We are dedicated to the customization of our products if required to provide total corrosion control services.





Our Services



GreenVCI® Global Services Network



We go beyond a mere level of R&D and sales management to provide a wide range of consulting services with an objective to create more businesses for our clients.

Australia: X-Rust (GreenVCI AU)

China: China Eundong

Germany/EU: Safepack GreenVCI

Indonesia: Eco GreenVCI Indonesia

Korea: GreenVCI Polartech

Malaysia: GreenVCI Services

Mexico: GreenVCI Mexico

Thailand: GreenVCI Thailand

USA: Eundong (USA)

- VCI Products & Service Customization
- VCI Production Methods
- VCI Packaging Services
- VCI Sales Strategy & References
- VCI Knock-Down (KD) Packaging
- VCI & Cleaning Solutions for Remanufacturing "REMAN"
- VCI Application for Oil & Gas Industry
- VCI Educational Seminars
- VCI Distribution Channel Management
- VCI Certifications & Quality Control
- VCI Laboratory Testing
- VCI Claim Management
- VCI Competitor Analysis





Corrosion

Corrosion is a natural process where metals return back to its original state. Corrosion takes place in an electrochemical process where the electrolytes often found in the form of humidity causes the electrons to flow from anode to cathode on the unprotected metal surfaces.

What Causes Corrosion?

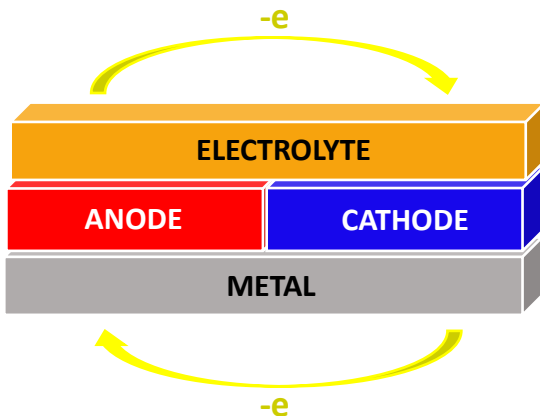
Volatility and Conditions for Corrosion

- Relative Humidity - in general, corrosion begins in RH levels of 70% with presence of agents
- Exposure to corrosion agents – NO₂, chloride, fluoride, sulfides (electrolytes in general)
- Volatility of aforementioned conditions

Cost of Corrosion?

Corrosion Cost in USA: USD 276 billion

Corrosion Cost in China: USD 250 to 400 billion

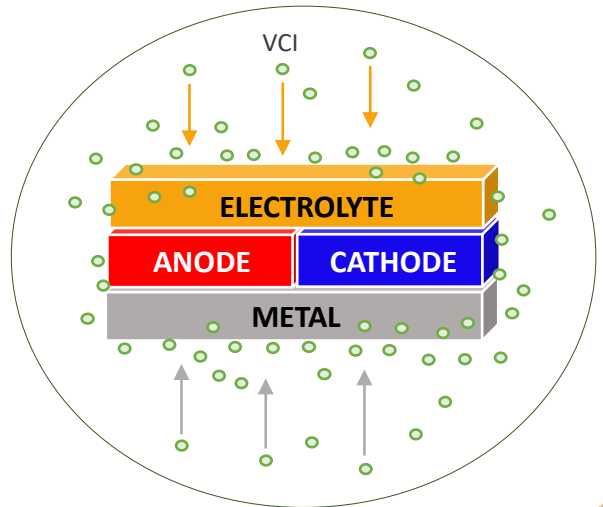


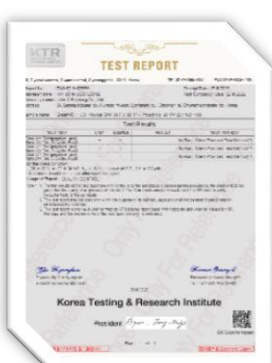
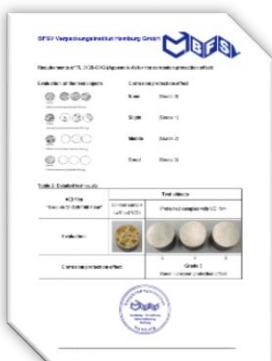
Volatile Corrosion Inhibitors (VCI)



VCI is a sophisticated yet economical way of protecting metals from corrosion. The atomic layer of VCI within the surface of the metal inhibits the electrochemical process. Our specialized eco-friendly VCI chemicals release corrosion inhibiting particles within the vapor area of the packaged metal. These VCI particles foam a thin protective layer about one molecule in thickness on the surface of the metal. This invisible layer of chemicals prevents oxidation, and naturally dissipates when air-flow is reintroduced. VCI chemicals artificially create covalent bonds (stable) with the metal surface to stop anode-cathode electron transmission.

VCI creates an artificial atmosphere which prevents O, OH ions from freely moving in the close space. VCI chemicals have a much lower vapor pressure than water (20 mmHg) at 0.01-0.4 mmHg; therefore VCI doesn't evaporate. VCI chemicals suspended in the air traps O, OH ions and create an artificial atmosphere which is rust-free.





With our vertically integrated R&D system (personnel, technology, and facilities) we strive to consistently innovate our product specifications to the world's highest standard. Such endeavors have resulted in great achievements as below:

Certificates & Test Reports

- Industrial Research and Development Registration
- ISO 9001:2001 & ISO 14001:2004 Certificates
- Volkswagen Certificate
- NACE TM0208-2008 Test Reports
- TL 8135-0043 Test Reports
- TL 8135-0002 Test Reports
- Korea Testing & Research Institute VCI Test Reports
- American Society for Testing and Materials Test Reports
- Centre Testing International Test Reports
- Absence of Nitrite & Secondary-Amines Analysis Test Reports
- REACH Compliance Test Reports
- RoHS Test Reports

Patents

We have over +20 patents registered up to date & 5 additional patents pending.

To list a few there are:

- VCI Powder Patent
- VCI Masterbatch Patent
- VCI Film Patent
- VCI Resin for Woven Kraft Paper Patent
- VCI Desiccant Patent
- VCI Corrugated Box Patent
- Biodegradable VCI Film for Silver and Copper Patent
- Biodegradable VCI Polypropylene Patent
- Biodegradable VCI Resin for Bubble Air Caps
- Flux Patent
- Aircraft Industrial Detergent Patent
- Industrial Detergent Patent- Rust Cleaner Patent

Yr 1940

FIRST GENERATION

Types of VCI: Amines, chromates, phosphates, and etc.

GENERAL FUNCTIONAL VCI TECHNOLOGY

Marketed Name: Dichan, Dicyclohexylamine, diisopropylamine, and etc.

Other Remarks: The US government funded a research to find a solution to prevent corrosion on the exported metal products during the World War 2 when the US military was dealing heavy corrosion problems in Southeast Asia.

Yr 1970

SECOND GENERATION

Types of VCI: Nitrite based

NITRITE BASED VCI TECHNOLOGY

Marketed Name: Sodium nitrite, potassium nitrite, and etc.

Other Remarks: Currently the most widely-used VCI products and often marketed as nitrite-free and non-nitrite. (Often times nitrite are excluded yet amines are present).

Yr 2000

THIRD GENERATION

Types of VCI: 100% no nitrite, 100% no primary amines, 100% no secondary amines, 100% no tertiary amines, and/or biodegradable, etc.

“GREEN” VCI RAW MATERIAL TECHNOLOGY

Marketed Name: Food grade, bio-based, organic salts, plant extracts, and etc.

Other Remarks: GreenVCI® is a 3rd generation eco-friendly VCI technology providing economical and customizable corrosion protection solution.

	1950s –	1970s –	2000s –	Recent
	1. Functional VCI	2. Nitrite-based VCI	3. Eco-friendly VCI	4. Food-grade VCI
Type of VCI	Amines, Chromates, Phosphates	Contains Sodium Nitrite	Does not contain heavy metals, secondary amines, and carcinogens (sodium nitrite, morpholine, etc.)	
Key Ingredients	Dicyclohexylamine	Sodium Nitrite	Food Additives (Organic Salts)	Plant Extract
	Diisopropylamine	Heavy Metals (Chrome, Phosphate)	Nitrite-free and non-nitrite frequently still contain limited nitrite content	Animal Extract
Marketed Names	Dichan, Dipan	Currently the most used VCI product	Nitrite-Free, Non-Nitrite	Bio-based, Food-grade
Eco-friendliness	🕒	🕒	🟢	🟢
Potential Hazard to Health	🟢	🕒	🕒	🟢

Case Studies

J&E has been committed to the continuous improvement of all GreenVCI® products and services in order to provide customers with innovative solutions to their problems.

Global companies included, but not limited to:

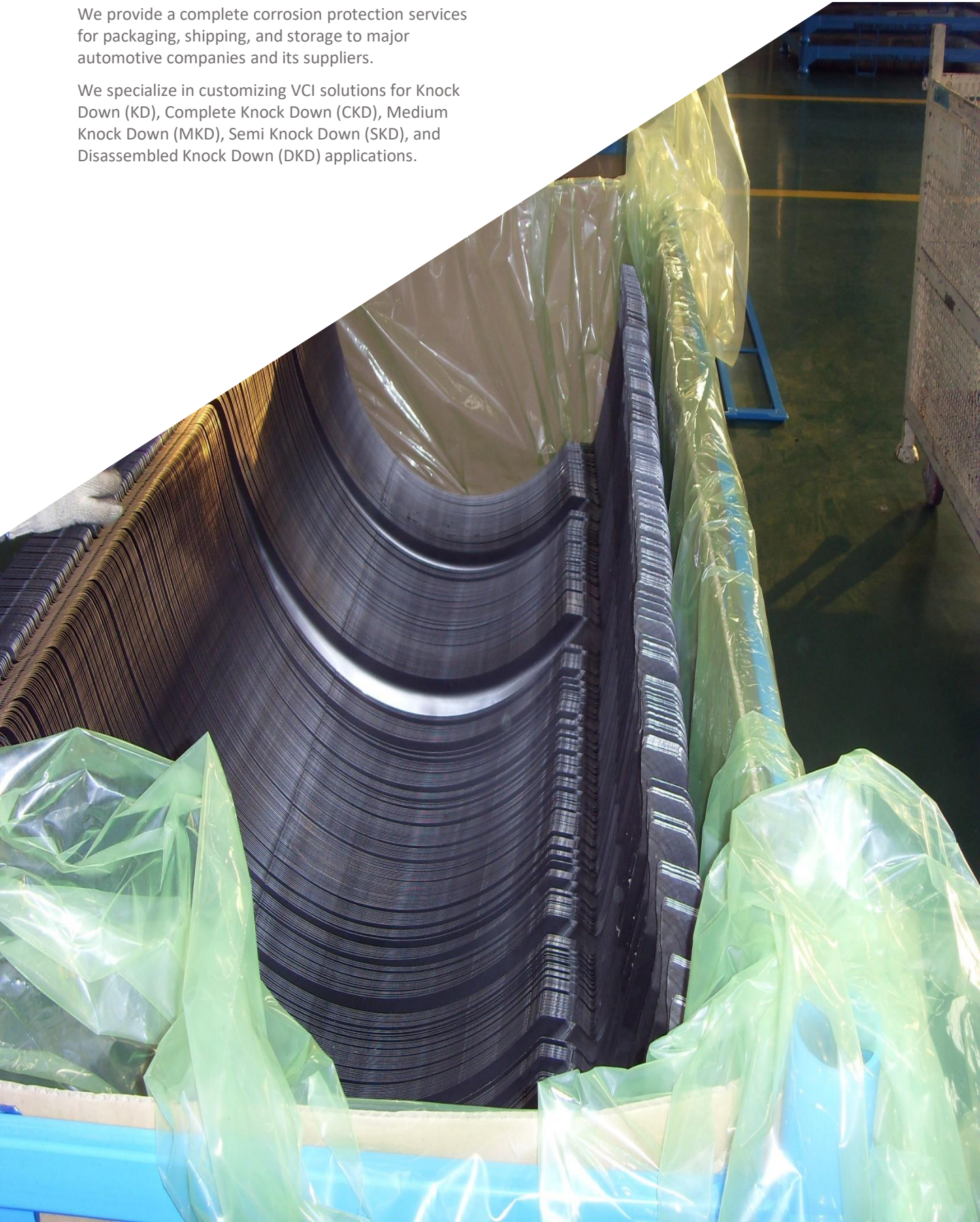
Hyundai, LG, KIA, Daewoo, Samsung, General Motors, POSCO, Doosan, Hyundai Steel, Chery Automobile, Geely, BMW, Claas, Volkswagen, Mercedes-Benz, and etc.

Automotive Industry

GreenVCI® has been applied by most major automotive companies.

We provide a complete corrosion protection services for packaging, shipping, and storage to major automotive companies and its suppliers.

We specialize in customizing VCI solutions for Knock Down (KD), Complete Knock Down (CKD), Medium Knock Down (MKD), Semi Knock Down (SKD), and Disassembled Knock Down (DKD) applications.



Oil & Gas Industry

GreenVCI® Oil & Gas “GOG” is a division of J&E that provides corrosion protection products and services for the Oil & Gas Industry.

We provide efficient corrosion management services and products globally while sustaining localization.

We customized preservation and corrosion protection programs to provide economical maintenance while sustaining functional VCI excellence.



Remanufacturing Industry

Remanufacturing also known as “REMAN” is recreating the sale of products recovered to be like-new or better functionality.

GreenVCI® Reman is a division of J&E that provides eco-friendly cleaning solutions and corrosion control VCI products for the remanufacturing industry.

Cleaning the core process is the most crucial step during the remanufacturing process and we provide customized total cleaning and corrosion protection solutions to fully assess inspection to help transform the core parts the be like new in condition.



Heavy Industry

Many countries rely on heavy industry as key parts of their overall economies.

GreenVCI® offers a full range of rust preventatives, removers, and corrosion protection solutions.



GreenVCI® VCI Powder Product List

VCI Powder GVP100

Water-soluble multi-purpose VCI powder for multi-metal corrosion protection

VCI Powder GVP110

Non-water soluble multi-purpose VCI powder for multi-metal corrosion protection

VCI Powder GVP120

Anti-caking VCI powder for multi-metal corrosion protection

VCI Powder GVP100 Micro

Fine grind +300 mesh multi-metal VCI powder

VCI Powder GVP200

Water-soluble VCI powder for ferrous metal corrosion protection

VCI Powder GVP300

Water-soluble VCI powder for boilers

VCI Powder GVP400

Multi-purpose biodegradable VCI powder for closed loop cooling systems, scale protection, hydro-testing, etc. (salt water compatible)

VCI Powder GVP500

Water-soluble VCI powder bulk for Polyvinyl alcohol (PVA) packaging

VCI Powder GVP600

VCI Powder for VCI paper production

VCI Powder GVPP

VCI powder packs for multi-metal corrosion protection

VCI Powder GVPPG

VCI powder (granule-type) packs for multi-metal corrosion inhibitor

VCI Powder GVP700

VCI powder tablets





GreenVCI® VCI Liquid Product List

VCI Liquid GVL100
General VCI Liquid for multi-metal corrosion protection

VCI Liquid GVL200
VCI liquid for hydrostatic and leak test (0.5-1% to water)

VCI Liquid GVL300
VCI Liquid for VCI Paper production

VCI Liquid GVL400
Water-based peelable temporary VCI coating

VCI Liquid GVL500
Water based VCI Liquid with an oil-like effect for multi-metal corrosion protection

VCI Liquid GVL800
Water-based multi-purpose VCI concentrate solution

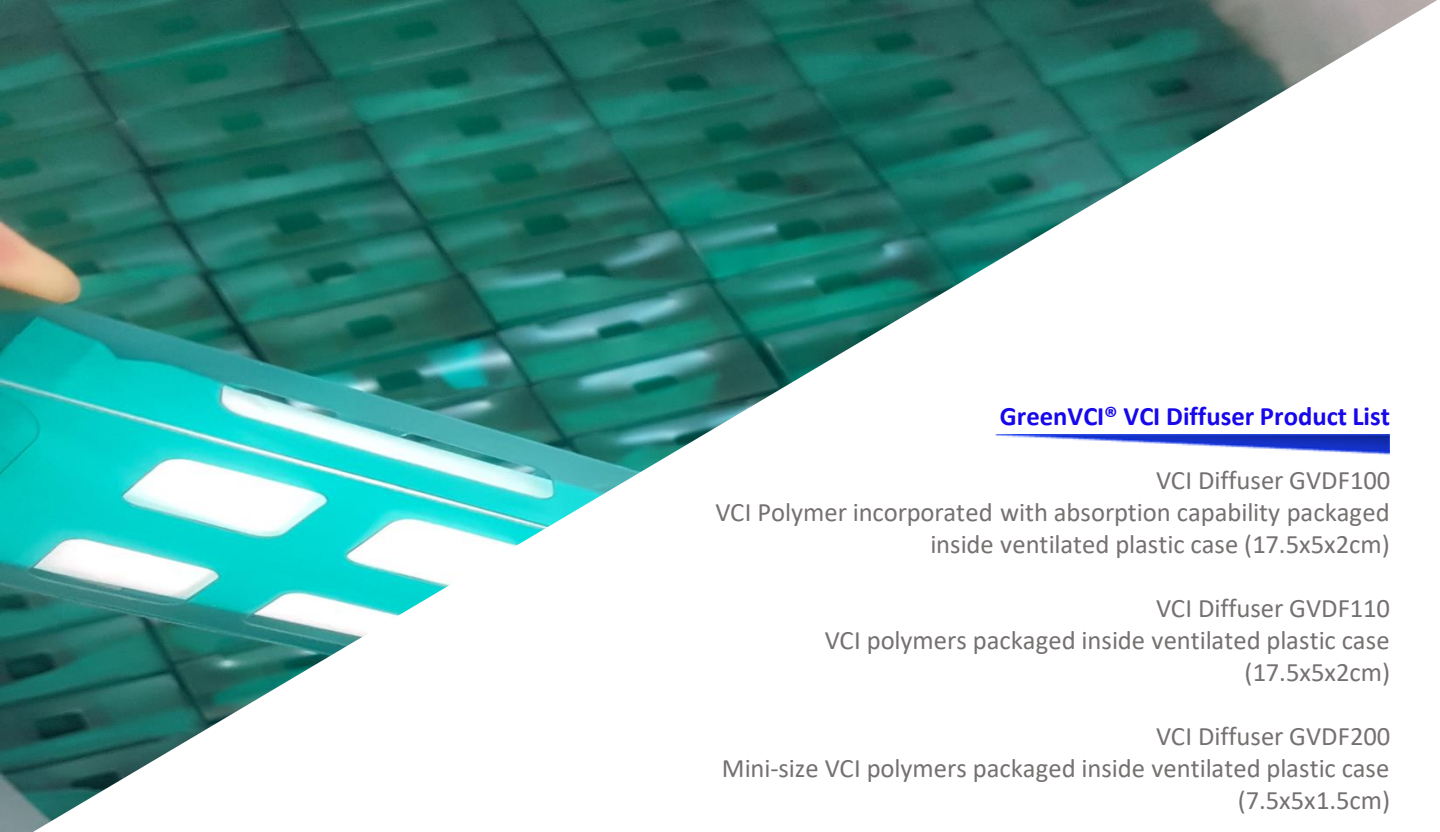
VCI Liquid GVL810
Multi-purpose biodegradable VCI Liquid concentrate for closed loop cooling systems, scale protection, hydro-testing, etc.
(salt water compatible)



GreenVCI® VCI Coating Paint

VCI Coating Paint GVL600
Water-based acrylic primer topcoat VCI solution

VCI Coating Paint GVL610
Oil-based anti-rust primer



GreenVCI® VCI Diffuser Product List

VCI Diffuser GVDF100

VCI Polymer incorporated with absorption capability packaged inside ventilated plastic case (17.5x5x2cm)

VCI Diffuser GVDF110

VCI polymers packaged inside ventilated plastic case (17.5x5x2cm)

VCI Diffuser GVDF200

Mini-size VCI polymers packaged inside ventilated plastic case (7.5x5x1.5cm)

GreenVCI® VCI Masterbatch Product List

VCI Masterbatch GVR100

VCI masterbatch for multi-metal corrosion protecting VCI film production

VCI Masterbatch GVR200

VCI masterbatch for ferrous metal corrosion protecting VCI film production

VCI Masterbatch GVR300

VCI masterbatch for non-ferrous metal corrosion protecting VCI film production

VCI Masterbatch GVR400

VCI masterbatch for (silver, copper, and brass) metal corrosion protecting VCI film production

VCI Masterbatch GVR500

VCI masterbatch for multi-metal corrosion protecting anti-static VCI film production

VCI Masterbatch GVR600

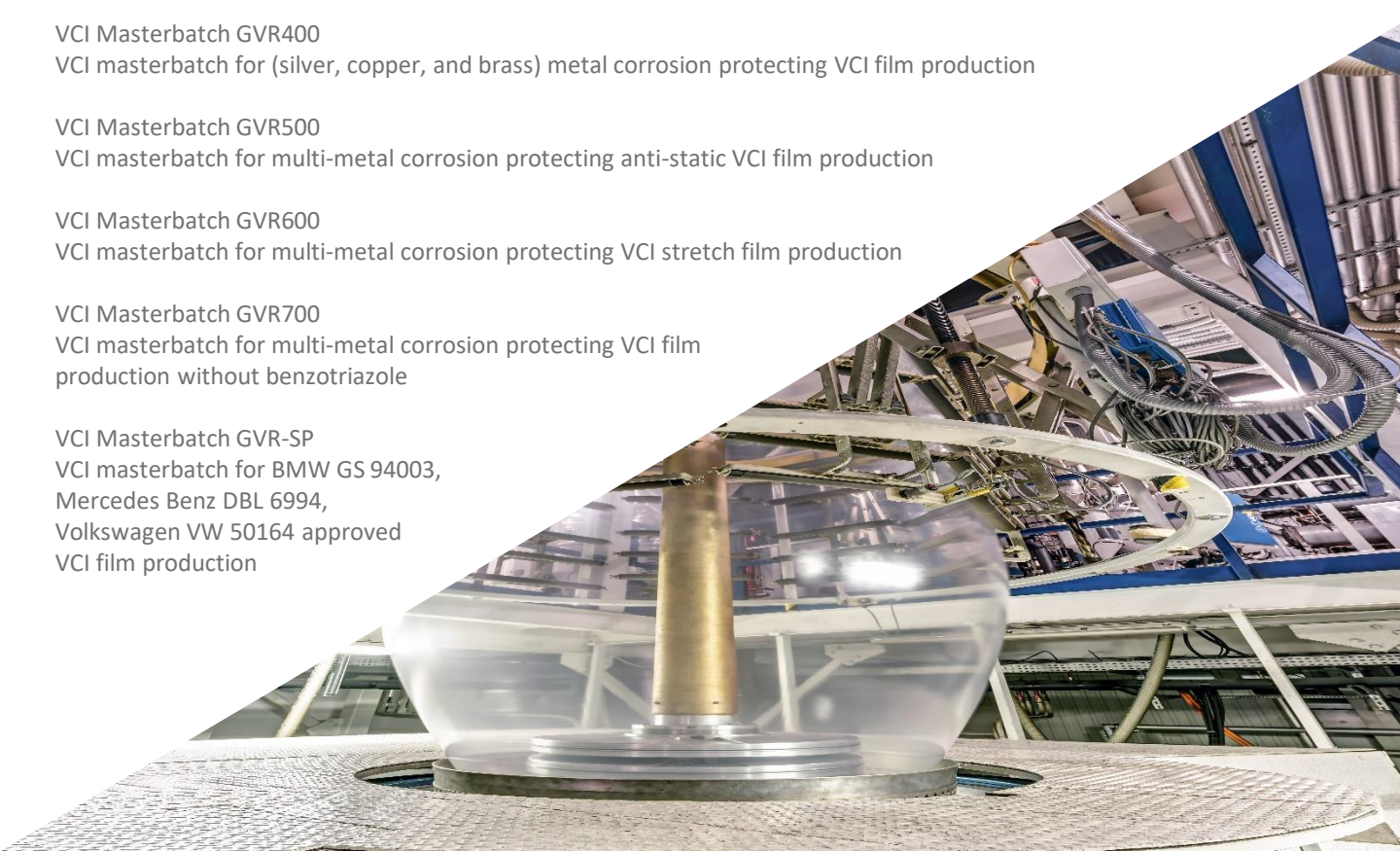
VCI masterbatch for multi-metal corrosion protecting VCI stretch film production

VCI Masterbatch GVR700

VCI masterbatch for multi-metal corrosion protecting VCI film production without benzotriazole

VCI Masterbatch GVR-SP

VCI masterbatch for BMW GS 94003,
Mercedes Benz DBL 6994,
Volkswagen VW 50164 approved
VCI film production





GreenVCI® VCI Oil Product List

VCI Oil GVL700

Oil-based VCI concentrate additives for VCI oil production

VCI Oil GVL710

VCI oil additives for turbine oil (lubrication)

VCI Oil VL720

Multi-functional corrosion inhibitor fuel additives (lubrication)

VCI Oil GVL730

Vegetable oil-based VCI (lubrication)

VCI Oil GVL740

VCI oil additives for lubrication oil

VCI Oil GVL750

Grease gel-based VCI

VCI Oil GVL760

Oil-based VCI

VCI Oil GVL770

Multi-purpose solvent-based VCI (lubrication)



GreenVCI® VCI Liquid Fog

VCI Liquid Fog GVLF100

Foggable water-based VCI Liquid for multi-metal corrosion protection

VCI Liquid Fog GVLF200

Foggable water-based VCI Liquid for ferrous metal corrosion protection



GreenVCI® VCI Supplementary Product List

GreenVCI® VCI Emitter

VCI Emitter GVE100

Easy-to-apply volatile corrosion inhibitor emitter device for non-ventilated control boxes

GreenVCI® VCI Tube

VCI Tube GVTU100

General multi-metal protection purpose tube strips

GreenVCI® VCI Chip

VCI Chip GVC100

Synthetic fiber tabs impregnated with VCI

GreenVCI® VCI Paper Product List

VCI Paper GVPR100

VCI kraft paper for multi-metal corrosion protection

VCI Paper GVPR110

VCI kraft paper polyethylene coated paper for multi-metal corrosion protection

VCI Paper GVPR200

VCI kraft paper for ferrous metal corrosion protection

VCI Paper GVPR210

VCI kraft paper polyethylene coated paper for ferrous metal corrosion protection

VCI Paper GVPR300

VCI kraft paper for non-ferrous metal corrosion protection

VCI Paper GVPR310

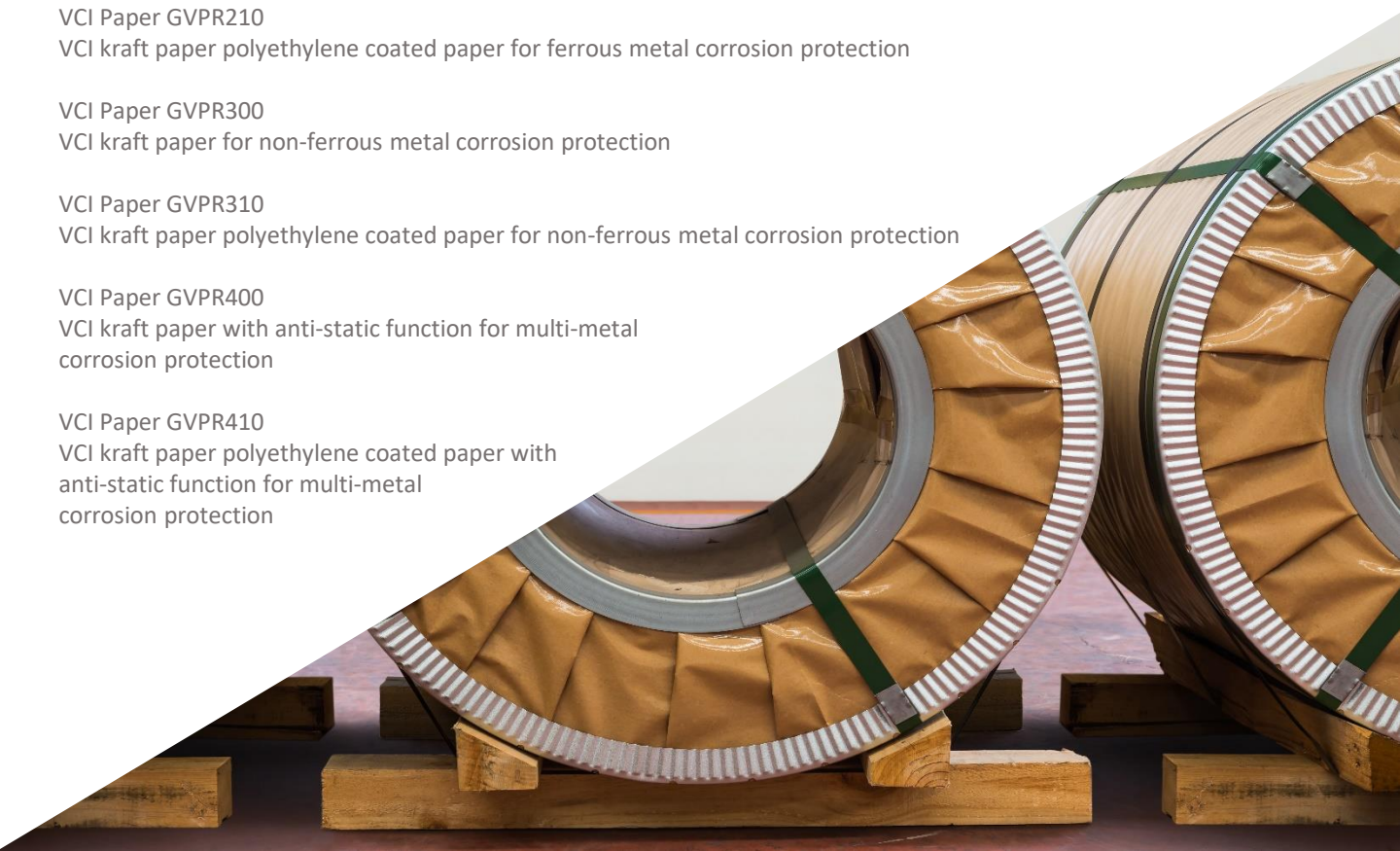
VCI kraft paper polyethylene coated paper for non-ferrous metal corrosion protection

VCI Paper GVPR400

VCI kraft paper with anti-static function for multi-metal corrosion protection

VCI Paper GVPR410

VCI kraft paper polyethylene coated paper with anti-static function for multi-metal corrosion protection





GreenVCI® VCI Film Product List

VCI Film GVF100

Multi-metal corrosion protecting VCI Film

VCI Film GVF110

Multi-metal corrosion protecting VCI Film with anti-static function

VCI Film GVF120

Multi-metal corrosion protecting VCI Film with UV protection

VCI Film GVF200

Ferrous metal corrosion protecting VCI Film

VCI Film GVF300

Non-ferrous metal corrosion protecting VCI Film

VCI Film GVF310

Non-ferrous metal corrosion protecting VCI Film (high tensile strength)

VCI Film GVF400

VCI heat shrink film with UV protection

VCI Film GVF600

Multi-metal corrosion protecting VCI Stretch Film

VCI Film GVF-SP

BMW GS 94003, Mercedes Benz DBL 6994,
and Volkswagen VW 50164
certified VCI Film

GreenVCI® VCI Desiccant Product List

VCI Desiccant GVD100

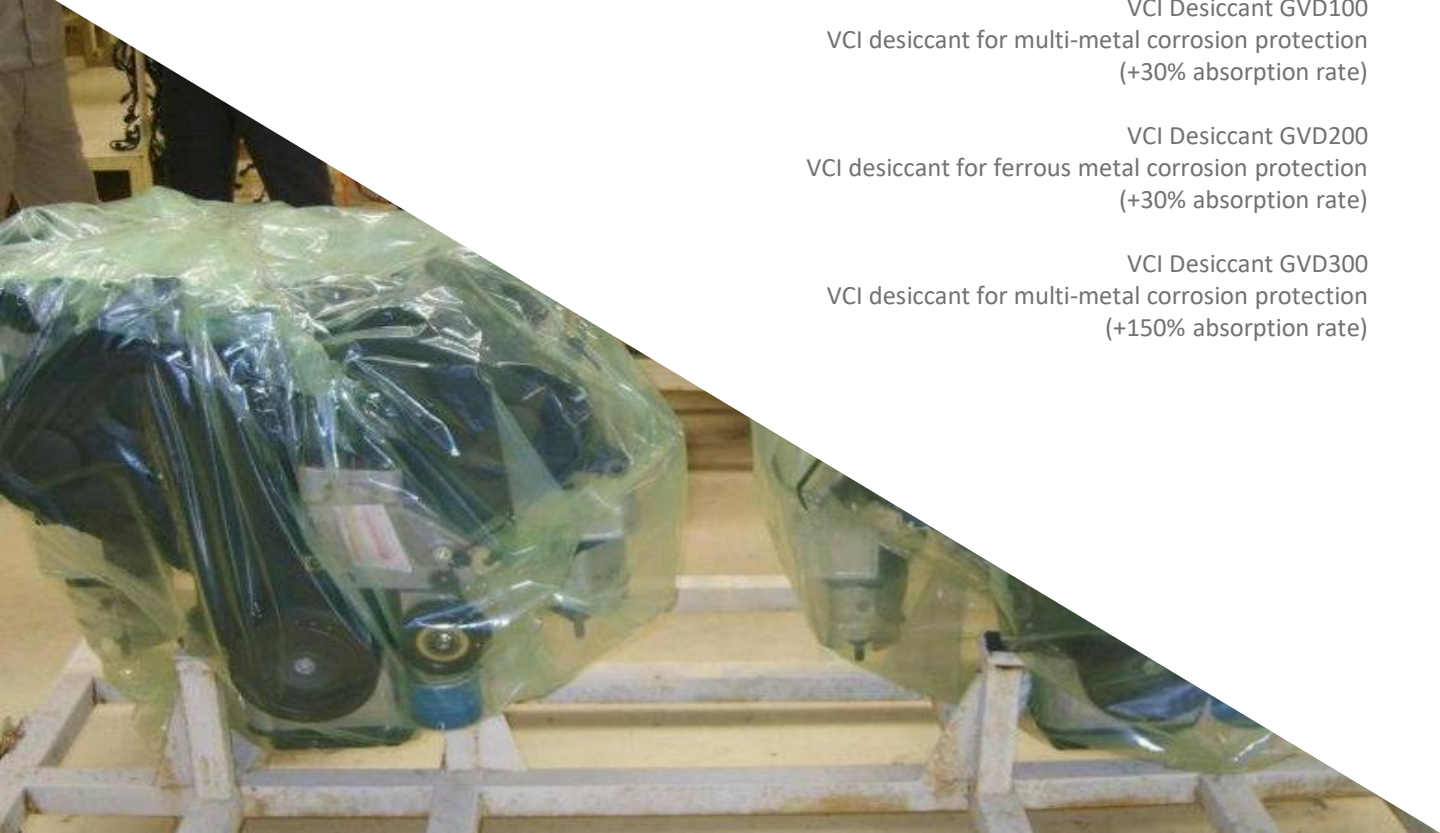
VCI desiccant for multi-metal corrosion protection
(+30% absorption rate)

VCI Desiccant GVD200

VCI desiccant for ferrous metal corrosion protection
(+30% absorption rate)

VCI Desiccant GVD300

VCI desiccant for multi-metal corrosion protection
(+150% absorption rate)



GreenVCI® VCI Reman EDC (Industrial Detergents & Degreaser Product List

EDC-100

Eco-friendly ultrasonic corrosion inhibiting industrial cleaner for remanufacturing

EDC-200

Biodegradable concrete residue remover for remanufacturing

EDC-300

Eco-friendly multi-purpose corrosion inhibiting industrial detergent for remanufacturing

EDC-310

Heavy-duty aluminium cleaning solution for remanufacturing

EDC-320

Eco-friendly gel-type corrosion inhibiting industrial cleaner and degreaser for remanufacturing

EDC-300(N)

Eco-friendly air-craft corrosion inhibiting industrial detergent
(Boeing D6-17487 Rev. R)



EDC-400
Silicone remover for remanufacturing

EDC-500
Eco-friendly heavy-duty corrosion inhibiting industrial powder-based degreaser for remanufacturing

EDC-600
3-in-1 multi-purpose paint remover, rust remover, and degreaser for remanufacturing

EDC-700
Eco-friendly organic acid rust remover for remanufacturing

EDC-710
Eco-friendly powder-type organic acid rust remover for remanufacturing

EDC-720
Eco-friendly gel-type organic acid rust remover for remanufacturing

EDC-900
Corrosion inhibiting electronics cleaner





JOHN & EUNDONG CO., LTD

50 Seongyeopjagi-Gil, Pungse-Myeon,
Dongnam-Gu, Cheonan-Si, 31216, South Korea

Phone: (+82)-41-621-0901

Fax: (+82)-41-621-0903

International: (+82)-70-4042-0902

Administration: info@greenvci.com

www.greeenvci.com

GREENVCI® GLOBAL SERVICES

Australia: X-Rust (GreenVCI AU)

China: China Eundong

Germany/EU: Safepack GreenVCI

Indonesia: Eco GreenVCI Indonesia

Korea: GreenVCI Polartech

Malaysia: GreenVCI Services

Mexico: GreenVCI Mexico

Thailand: GreenVCI Thailand

USA: Eundong (USA)

Global Services: globalservices@greeenvci.com