adpack®

Thank you very much,
50th anniversary of
our founding!

Volatile Corrosion Inhibitor Treated Paper

adpack®

Eliminate Rust with adpack®!

ADCOAT CO., LTD.

Management philosophy
“Sanpo-yoshi”

Good as Seller
We must go on together with employees forever.

Good for Buyers
We must supply confident products & serve for our Customers’ satisfaction.

Good for Society
We must correspond to environmental issues & chemical regulations to contribute for everybody.

I myself have taken the meaning in good part as our company, though this is the old management philosophy carried by Japanese merchants.

Adcoat Co., Ltd. was established in 1968 at Higashi-Osaka, famous city for "Monozukuri" Products Manufacturing.

Volatile corrosion inhibitor treated paper, produced by our company, has been widely applied among the major steel mills, car manufactures and blade producers etc. since 50 years ago.
However, the visibility with the public is very low, because our products have been mainly used for their export packaging.

Hot & humid climate in Asia, including Japan, cause big trouble in the form of rusting.
We do hope adpack, volatile corrosion inhibitor treated paper, can be easily helpful to protect from rusting for everybody.

President
Motoshi GOTO

adpack®
Products portfolio

Change to our reliable adpack® VCI treated paper, instead of messy oils & toxic chemicals, to keep your factory clean!
—Improve further your work efficiency!

adpack-G
(Impregnated type for Iron & Steel)

Performances & reliability, well-known over 40 years of experience. Approved by the test specified in JIS Z 1535.

VCI* impregnated into kraft paper (Anti-corrosion paper), mainly for iron & steel products, car parts and machine apparatus parts etc. Accumulated over 40 years of experiences for various customers.

adpack White
(Coated type for Iron & Steel long term storage)

All time best seller, reliability accumulated for over 50 years.

VCI* coated on kraft paper, to protect the works for long term storage, mainly for blades such as cutters and knives, steel, cars, various components and so many applications. We have more than 50 years experiences and we can proudly say this type is our enduring best seller.

*VCI stands for Volatile Corrosion Inhibitor.

adpack-S
(Impregnated type for Ferrous & Non-Ferrous)

Apply for metallic composites and galvanized products. Approved by the test specified in JIS Z 0321.

The great performance of corrosion-proof for Iron & Non-Ferrous materials (Copper, Brass, Phosphorous Bronze and Tin-plated) and Plated materials (Zinc, Chrome & Nickel) as well as for plastics due to less negative effect.

adpack-C
(Impregnated type for Copper & Copper Alloy)

Excellent anti-corrosion effect for copper products. Approved by the test specified in JIS Z 0321.

This type is made by impregnating VCI into kraft paper, therefore can be used for electronic parts and employed widely for copper wires, copper sheets and copper tubes etc.

Moisture-proof packing
(Shelf life is up to 3 years—Unopened condition)

Form of delivery
(Roll type & Sheet type)

Standard products (Width 1m × 100m length) is ready for shipment from one roll on the same day upon your order confirmed.

adpack Production Line

We are always trying our very best to make your requirements satisfied with shortest lead time, competitive price, highest quality under great flexibility.

ISO9001
Approved and Certified factory.


Coating VCI on the paper


High speed dryer


Automatic winder


Bobbin slitter


Packaging


Shipping

Economy Jumbo Roll (Oversea model)

Kraft paper base
Jumbo roll (above 1000m)

Crepe paper base
With Bobbin Slit

Cloth type for heaver products

Packing

Moisture-prof paper packing (3 years shelf life)

Type	Form	Specifications	Rust-Proof Effective time
adpack-G Impregnated for Iron & Steel Low cost Type anti-corrosion paper adpack®	AGKT-6（M） 1000mm×1000m	60g acid-free Kraft paper for rust proof Roll dia φ355mm (ID φ78mm) Weight 69kg	6–12 months
	AGKT-6（M） 1000mm×7900m	60g acid-free Kraft paper for rust proof Roll dia φ974mm (ID φ78mm) Weight 517kg	6–12 months
adpack-G Impregnated for Iron & Steel anti-corrosion paper adpack®	AGK-6（M） 1000mm×1000m	60g acid-free Kraft paper for rust proof Roll dia φ355mm (ID φ78mm) Weight 74kg	6–12 months
adpack-S Impregnated for Ferrous & Non-Ferrous anti-corrosion paper adpack®	ASK-6（M） 1000mm×1000m	60g acid-free Kraft paper for rust proof Roll dia φ355mm (ID φ78mm) Weight 74kg	6–12 months
adpack-C Impregnated for Copper & Copper Alloy anti-corrosion paper adpack®	ACK-6（M） 1000mm×1000m	60g acid-free Kraft paper for rust proof Roll dia φ355mm (ID φ78mm) Weight 64kg	6–12 months

NOTE
Model Number (M): with adpack Logo
Model Number (N): No Logo
Model Number (UNM): We can support CLP regulation for export to EU.Please ask us for more information.
We can take special order for customers Logo.

Standard Small Roll (Oversea model)

Kraft paper base
(Coated type TK, white side effective)

Kraft paper base with PE
Laminated (AGP / ATP / ASP)

Moisture-proof paper
packing (3 years shelf life)

Type	Form	Specifications	Rust-Proof Effective time
adpack-G Impregnated for Iron & Steel anti-corrosion paper adpack®	AGK-7（M） 1000mm×100m	75g acid-free Kraft paper for rust proof Roll dia 135mm (ID φ38mm) Weight 9kg	6–12 months
	AGP-7（M） 1000mm×100m	75g acid-free Kraft paper for rust proof + PE Laminated Roll dia 140mm (ID φ38mm) Weight 11kg	12–36 months
adpack White Coated for Iron & Steel long term storage anti-corrosion paper adpack®	ATK-610（M） 1000mm×100m	60g acid-free Kraft paper for rust proof Roll dia 125mm (ID φ38mm) Weight 8.3kg	10–14 months
	ATK-810（M） 1000mm×100m	75g acid-free Kraft paper for rust proof Roll dia 135mm (ID φ38mm) Weight 10kg	10–14 months
	ATP-810（M） 1000mm×100m	75g acid-free Kraft paper for rust proof + PE Laminated Roll dia 145mm (ID φ38mm) Weight 12kg	12–60 months
adpack-S Impregnated for Ferrous & Non-Ferrous anti-corrosion paper adpack®	ASK-7（M） 1000mm×100m	75g acid-free Kraft paper for rust proof Roll dia 135mm (ID φ38mm) Weight 9kg	6–12 months
	ASP-7（M） 1000mm×100m	75g acid-free Kraft paper for rust proof + PE Laminated Roll dia 140mm (ID φ38mm) Weight 11kg	12–36 months
adpack-C Impregnated for Copper & Copper Alloy anti-corrosion paper adpack®	ACK-6（M） 1000mm×100m	60g acid-free Kraft paper for rust proof Roll dia 115mm (ID φ38mm) Weight 7kg	6–12 months

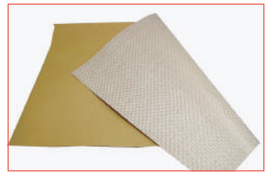
NOTE
The above corrosion-proof effective period are for reference only. Actual condition may varies.
Effective time can be extended for up to 36–60 months if stored in sealing condition.

Special order items & others

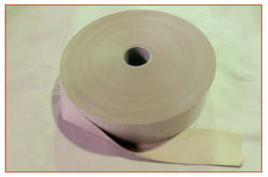
Order form Cloth pasted products

(Example) G K X 6 P - 8 * * (N) Size

- **G** Application
  - G: Impregnated type for Iron & Steel
  - T: Coated for long term Iron & Steel storage
  - S: Impregnated type for Ferrous & Non-Ferrous
  - C: Impregnated type for Copper & Copper Alloy
  - ZV: Packing of Galvanized & Iron & Steel-KD
  - SN: Impregnated type for Tin-plated products
  - ZP: Impregnated type for Galvanized sheets
- **K** Kraft paper, **X** Cloth
- **6** Size
  - 6: 6 strings x 6 strings / square inch
  - 8: 8 strings x 8 strings / square inch
  - *Hard-to-tear by cloth pasted, best choice for heavy load etc.
- **P** PE
  - P: With
  - Without
- **8 * *** Weight / m^2
  - 6: 60g
  - 7: 75g
  - 8: 75g
  - 610: 60g for T-type
  - 810: 75g for T-type
- **(N)** Mark
  - (N): No Logo
  - (M): ADCOAT or Customer's logo
- **Size**
  - Roll: W(mm) x L(mm)
  - Slit product: A(mm) x B(mm)



Cloth pasted for heavy load



Roll shaped (slitted)

Bag shaped

Big size flat sheet

Order form Crepe processed products

(Example) G I C P - 2 * (N) Size

- **G** Application
  - G: Impregnated type for Iron & Steel
  - T: Coated type for long term Iron & Steel storage
  - S: Impregnated type for Ferrous & Non-Ferrous
  - C: Impregnated type for Copper & Copper Alloy
- **I** Paper with yarn
  - I: With
  - Without
- **C** Crepe
- **P** PE
  - P: With
  - Without
- **2** 2 sheets pasted
- ***** Weight / m^2
  - 5: 50g+50g
  - 6: 60g+60g
- **(N)** Mark
  - (N): No Logo
  - (M): ADCOAT or Customer's logo
- **Size**
  - Roll: W(mm) x L(mm)
  - Slit product: A(mm) x B(mm)

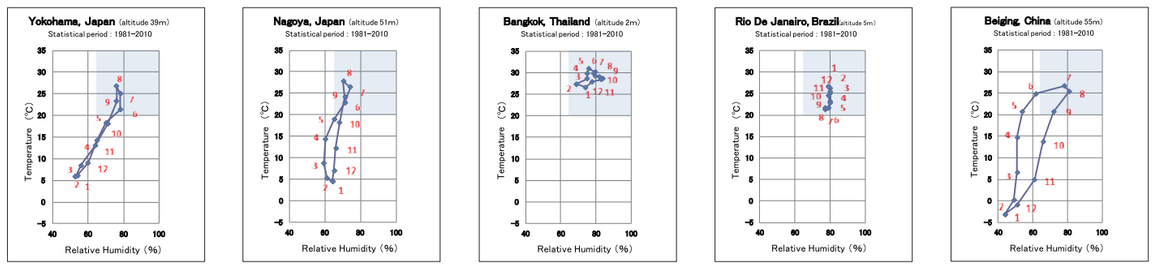
Bobbin slitter

Rolled product (Slitted)

Small size rolls for packing by hands

Customer's logo printed by orders

Climograph



Range of the relative humidity is Over 65% and temperature is over 20℃. The humer is each month.
This data from National Astronomical Observatory "Science chronology Y2009" and Maureen (Y2008).

Big satisfaction at these fields

50 years contribution for more than 4,500 customers by VCI treated paper! ADCOAT products have been widely appreciated, because of the trust and actual performance by steel mills, car manufacturers, machine parts manufacturers and medical equipments makers and so on.

At many steel mills

At major car manufacturers

Please eliminate rust trouble with our adpack® for protecting your products, instead of using rust preventive oil!

Keep your factory clean and increase more your working efficiency with adpack®!

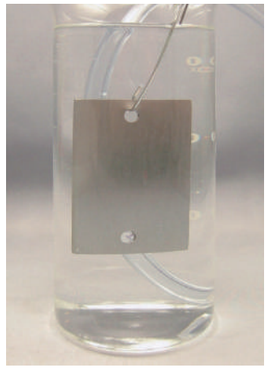
Photos by courtesy from Messrs. Shinko Engineering

Technical Information

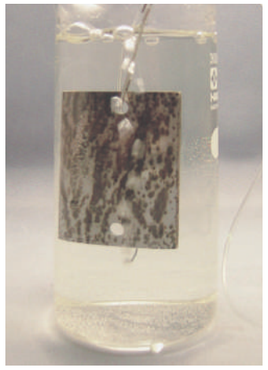
Why does Iron rust?

Iron ore, which is the raw material of Iron, is a stable oxide, mainly composed of Iron and oxygen in its natural state. Iron, reduced from iron ore by removing oxygen, is chemically unstable. Therefore the Iron attempts to go back, under the influence of temperature and humidity, to the original stable oxide condition. This oxide is usually called as the rust. In other words, both oxygen and water are indispensable for rusting Iron. The lack of water is the reason why Iron does not rust (keeping it in dried air).

Iron (Fe) will be solved into the water, as the formula right side (1) indicates, by being ionized (Fe^{2+}) when contacts with the water, and discharging the electron (e^-). The electrons discharged from the Iron contributes to create hydroxide ion (OH^-) being consumed by dissolved oxygen in the water, as the formula (2). The hydroxide becomes white turbidity of Iron (II) hydroxide ($Fe(OH)_2$) by reacting with iron ion as the formula (3), and then further being oxidized, as the formula (4), to be settled out with reddish brown precipitation of Iron (III) hydroxide ($FeO(OH)/nH_2O$). The deposition is so called as red rust, which is occured on the Iron surface in the very porous form and therefore protective action is weak and poor for the base Iron, will be successively advancing as far as the oxygen and water are available.



The gloss does not disappear even if the Iron piece was placed in the pure water (oxygen is not contained).



If the air (oxygen) is blown into the pure water, the Iron piece will get rust and the gloss on the surface will be disappeared.

The rusting phenomena can be shown as the following formula.

$Fe \rightarrow Fe^{2+} + 2e^-$ ——— (1)

(The Iron solves into water by ionizing)

$1/2O_2 + H_2O + 2e^- \rightarrow 2OH^-$ ——— (2)

(Oxygen, contained in the water, catches a electron and changes to hydroxide ion (OH^-))

$Fe^{2+} + 2OH^- \rightarrow Fe(OH)_2$ ——— (3)

(The Iron ion and the hydroxide ion react each other, then make the white turbidity of Iron (II) hydroxide).

$2Fe(OH)_2 + H_2O + 1/2O_2 \rightarrow FeO(OH) \cdot nH_2O$ ——— (4)

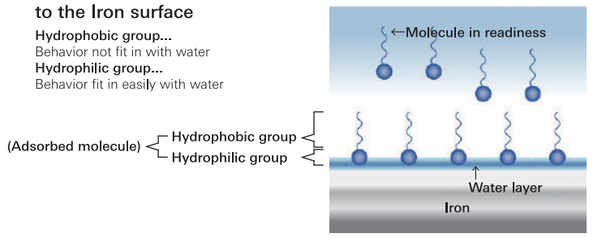
(By oxidization further, the Iron is settled out with reddish brown precipitation of Iron (III) hydroxide (red rust)).

The mechanism of the VCI (Volatile Corrosion Inhibitor) treated paper act effectively.

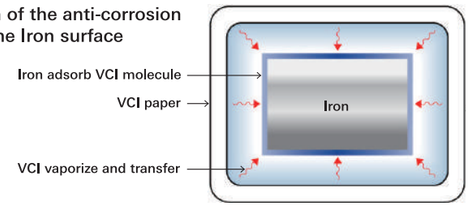
The VCI (Volatile Corrosion Inhibitor), impregnated in the VCI paper, will be vaporized and directly adsorbed onto the metal surface or adsorbed by the water layer on the metal surface.
Depending on the terms and storage conditions, the anti-corrosion effects can be lasted for several years.
The action is advanced on the molecular level, and in the nanoscopic invisible world.

The adsorption mechanism of Volatile Corrosion Inhibitor to the Iron surface

Hydrophobic group...
Behavior not fit in with water
Hydrophilic group...
Behavior fit in easily with water



Formation of the anti-corrosion layer on the Iron surface



JIS Z 1535

Testing to realize how Volatile Corrosion Inhibitor is effective (Volatile Inhibitor Ability Test)

This method is to evaluate the capability of the VCI paper for Iron & Steel, so called as VIA Test. By keeping Iron & Steel, the test piece, without contact to “VCI treated paper”, the piece is forced to get rust by dew condensation. In other words, it is the test to make sure whether the VCI, contained in the VCI treated paper, has the capability to protect Iron & Steel from rusting. In this testing method, the extraordinary heavy dew condensation will occur due to the piece being rapidly cooled down under high humidity condition. In this way, the test is carried out in the toughest condition.
This is to reconfirm the capability of the VCI treated paper under extremely serious condition. Using the water solution of glycerol as shown in figure below, the piece, with and without VCI treated paper are separately tested, in a wide-mouth glass jar (a humidity of 90% and a temperature of 20 degree C). After a specified period of time, cold water (2 degree C) is poured from the upper side of the aluminium tube to force the test piece condensed. After 3 hours, the capability of the VCI treated paper will be evaluated by checking the piece for the rust effect.

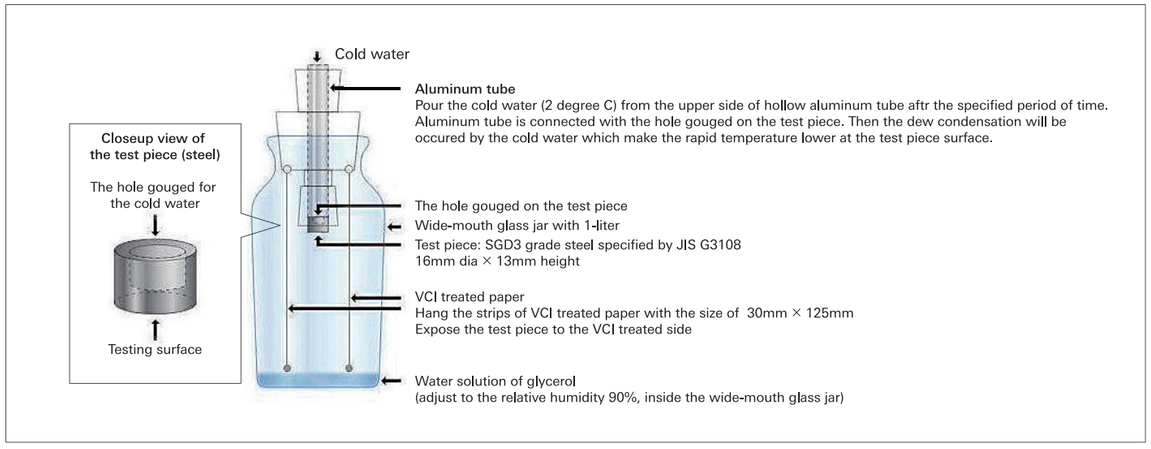


Fig VIA Capability Test
H-type (Rapid effect) = No rust is discerned on the test piece, even 1 hour after making the piece dew condensed
EL-type (Slow effect) = More than 50% (Anti-Rust rate), even 20 hours after making the piece dew condensed
“H” is High vaporizability
“EL” is Extremely Low vaporizability

The test pieces (Steel) after having the VIA test

H-type test
(dew condensation after 1 hour)

adpack AGK-7 used

Blank (VCI treated paper not used)

EL-type test
(dew condensation after 20 hours)

adpack ASK-7 used
(Anti-Rust ratio 80~90%)

Blank (VCI treated paper not used)

Technical Information

Recommendable Types of "adpack®" for Various Metal Products

adpack® (VCI treated paper)		Iron & Steel	Various plated steel				Copper, Copper Alloy		
			Zinc*	Tin	Chrome	Nickel	Copper	Brass	Phosphor Bronze
Impregnated type for Iron & Steel	adpack-G	◎	—	○	○	○	×	×	×
Coated for long & Steel long term storage	adpack White	◎ Long term	×	○	○	×	×	×	×
Imprregnated type for Ferrous & Non-Ferrous	adpack-S	○	○	○	○	○	◎	○	○
Impregnated type for Copper & Copper Alloy	adpack-C	—	—	○	○	○	◎	◎	◎

Please pay your special attention for the galvanized products, because the effect maybe different depending on their surface treatment variations.

Criteria on choice ◎: Very effective ○: Effective —: No effect ×: No good (not recommendable)

Characters Comparison: "adpack®" (VCI paper) vs. VCI Film vs. Rust Preventive Oil

	adpack® VCI paper		VCI Film		Rust Preventive Oil	
	Strengths	Limitations	Strengths	Limitations	Strengths	Limitations
Working Process	1. Easy-to-use 2. Helpful for areas clean 3. Usable upon unpacking	1. Less distributor	1. Easy-to-use 2. Helpful for areas clean 3. Usable upon unpacking	1.Less distributor	1.Versatile 2.Easily obtainable	1. Troublesome in application / removal 2. Going backwards to beautify the areas
		1. Impossible heat-seal 2. Paper powder by chance	1. Seal by heat O.K. 2. No paper powder trouble			
		1.Pack with water-proof material by case	1.Unnecessary water-proof material when packing			1.Necessary to pack with grease-proof barrier material
	1.Effect in every hole & corner even for complicated shape metal products can be expected					1.Difficult to apply or remove in case of complicated shape metal products
Anti-Rust Effect	1. Rapid effect 2. Best performance 3. Effective even "adpack" and metal products are put together into plastic bag etc. 4. Effective even used as liner in tote box 5. "adpack" can adsorb condensation water		1. Anti-rust effect mainly dependent on film's moisture resistance	1. Slow reaction 2. In case of active dew condensatio, the water cannot be adsorbed and cause rusting	1. Fast reaction 2. Good performance	1. In case of active dew condensation, the water cannot be adsorbed and cause rusting
Target Metals	1. Various metal products	1. Use proper type by target metal products	1. Various metal products	1. Use proper grade by taarget metal products	1. Various metal products	
Safety & Environment	1. Only a few chemicals are used 2. Disposable easily as paper waste	1. Necessary to separate when using together with water-proof material (plastic bags etc.)	1. Only a few chemicals are used 2. Disposable as single material			1. Environmental deterioration at working areas 2. Necessary to use solvent when removing (under VOC rules)
Packing methods under JIS Z 0303	RP1-K1・RP1-K2・RP2-K・RP3-K		RP1-F		RP1-P1・RP1-P2・RP2-P・RP3-P	

Useful hints when using VCI treated papers effectively

<When using for wrapping>

◉ Wash out and remove fingerprints and dirt on the metallic products prior to wrapping.
◉ Wrap the washed metallic products as soon as possible.
◉ Wrap the metallic products directly with VCI treated side on the paper (no adpack logo printed side or PE Laminated side)
◉ Don't put anything between VCI paper & the products. If anything between them, VCI effect cannot be performed.
◉ The effect of VCI can be increased if products tightly sealed by plastic bag etc.
◉ Refer to JIS Z 0303 (General rules for rust preventive packaging method) for the details.

<When using VCI paper in the enclosed space by putting metallic products together>

◉ In order to remove fingerprint and dirt etc. , make the metallic products clean prior to wrapping. Wrap the products after cleaning as soon as possible.
◉ Put VCI paper and the metallic products together into plastic bag or into the tightly sealed and/or non-perforated container. And, try to keep the metallic surface to be protected and VCI paper as close as possible, keep within 30cm as a guide. As a reference, use VCI paper with 30cm × 30cm or more in case of the enclosed vessel of 30cm × 30cm × 30cm size.
◉ In this case, it is vital that the wrapping should be tightly sealed.
◉ In case of the metallic products being in a state of close contact each other, VCI performance cannot be expected on the contacting surface.
◉ When the metallic products are closely contacted with plastic bag, VCI effect cannot be worked to the contacting surface.
◉ Refer to JIS Z 0303 (General rules for rust preventive packaging method) for the details.

<Discoloration over time>

VCI treated paper is characteristically prone to discoloration over time.
◉ This phenomenon happens, because the corrosion inhibitor contained in the VCI paper is getting oxidized as well as paper itself discolored over time.
◉ The color is gradually changed 3–6 months after the produced date. (High temperature in summer also increases the discoloration speed.)
◉ However, please be assured that this will not have any effect on the performance of the VCI paper.

adpack-G

<How to store VCI treated paper safely>

◉ Be always stored in cool and dry places away free from water and direct sunlight, although adpack VCI paper are packed in moisture-proof paper. By any means, avoid water at all. The estimated shelf life of VCI paper is in an unopened state about 3 years after production date, depending on the storage conditions.

<Precautions when handling>

◉ Avoid using in enclosed places, and make sure proper ventilation.
◉ In high temperature circumstances, rapid vaporization maybe happen.
◉ Pay special attention for people with sensitive or allergy.
◉ Dont use for other purpose than rust prevention.
◉ If unwell happened during use, rest in the good ventilation and contact with health-care professionals depending on the case.
◉ Wash the affected area with clean water immediately, when itch or rash occurs during use of VCI paper and contact with doctor in case.

(Conformed to the rules specified by Japan Association of Corrosion Control (JACC))

adpack® is
friendly for the environment.

Produced and sold by:

ADCOAT CO., LTD.

ISO9001: 2015

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Agency: