

Current Trend and Problem of Thermal insulated glass coating market in Japan

< Development history and problems >

About 20 years ago, there were many complaints that NTT's public telephone BOX was particularly hot in the summer, and the main policy was to attach a black film at that time. However, the need for window products that are transparent to visible light and have heat shielding performance has increased, and in 2000, the world's first thermal barrier coating agent for window glass was developed and started to sell. At the beginning of this industry, to invest and join a new business, 1 million to 3 million yen is required at the time of the contract, and even if purchased, the material cannot be resold, and royalty is generated in application sales. In addition, the material cost was about 5000JPY per square meter, and the application cost was 20,000JPY per square meter. Also, the coating application was difficult, and there were many failures due to uneven coloring and dripping, so there were some manufacturers that were expensive to conduct application training and cost 1 million yen per person. Over 300 companies in the past 10 years have not been able to monetize as an application business, Therefore, the main revenues were membership fees, royalties, expensive application training costs, and royalties. This business development was different from the original purpose of the coating application business, and this industry could not form a large market.

<The Reason for popularization>

In Japan, the implementation of the revised Energy Conservation Law in 2010 has required energy conservation measures for expansion and renovation of existing buildings over 300 square meters. As an energy-saving product that reduces air conditioning costs, mainly for companies, heat-shielding glass coats for existing window glass have begun to attract attention. Also, in the summer of 2010 in Japan was extremely hot and over 30°C continued for more than 40 days, and even if the air conditioning was used, the room was still hot. As a result, a large number of coating application requests began to increase nationwide as a measure against heat rather than energy-saving measures from buildings, restaurants, hotels, and tower apartments with many windows.

Furthermore, since the ECO-Friendly subsidy was granted by the Japanese government to the private house for the installation of LOW-E double glazing glass and inner window sashes in 2010, the glass and sash industry promoted TV commercials extensively. Customers recognized the importance of heat insulation measures for window glass at that time. However, LOW-E double glazing glass and inner window sashes are 40,000 to 50,000JPY/sqm in Japan, and cost nearly 1 million JPY at 20sqm. So even if there was subsidy. The customer did not request construction. In contrast, a Thermally insulated glass coat of 12,000JPY per square meter began to attract attention because of its low cost.

In particular, there are three major points for indoor energy conservation measures in existing buildings.

The first is air conditioning cost reduction,

The second is lighting / LED measures,

The third is heat insulation measures for window glass.

71% of the solar heat comes into the room from the window in the summer, and 48% of the heating heat escapes from the window in the winter, assuming the whole building as 100%. In other words, in building of energy saving measures, heat shielding against window glass is the most effective.

<Full-scale spread>

With the occurrence of the Fukushima nuclear power plant accident caused by the Great East Japan Earthquake on March 11, 2011, TEPCO became an urgent issue for all power-saving measures, including a power usage restriction order. In particular, the word "cut at peak hours" started to attract a great deal of attention in the afternoon of the summer to reduce air conditioning costs.

During the daytime, air conditioning costs, which consume the most electricity in office buildings, account for 48% of the total time at 14:00. Power saving measures have attracted attention, and many companies have begun to actively adopt heat shielding films and insulating glass coat. In 2012, the lack of power supply such as Kansai Electric Power and Kyushu Electric Power became a hot topic. Due to the shortage of electricity, the issue of restarting nuclear power plants, including the Daii Nuclear Power Plant, became a big topic. As a result, the need for insulating glass coats has expanded. In such a social situation, especially from 2011 to 2016, major paint manufacturers such as Kansai Paint, Nippon Special Paint, and Ishihara Sangyo have newly entered and started to develop and sell insulation glass coats. It began to be adopted mainly by painting application company.

《Glass Coat industry becomes obsolete during 2014~2018》

Kansai Paint and other major listed paint manufacturers have newly entered the business, so the other glass coat manufacturers and sales companies that have been doing business with membership fees and royalties have been sluggish and many companies have gone bankrupt. In addition, a subsidy was issued by the government for the replacement of heat-shielding window glass, but it was soon completed, and since 2012 the national policy has changed to a subsidy for the solar business. Therefore including thermal insulation glass coating, power-saving products no longer suddenly popular.

Glass coating agents for window glass developed by these major paint manufacturers are manufactured using ATO, a thermal barrier nanomaterial with a near-infrared cut of 50% or less, and cannot exceed 3M for high-performance thermal barrier films. In addition, problems such as uneven coating and dripping occurred, making the application too difficult and the applicator hated handling. Later, Kansai Paint stopped selling thermal insulation coating agents for window glass.

《From 2019 to an era when only genuine products survive》

What are the conditions for a real product?

1、Near infrared ray 80% cut, the entire infrared ray 90% cut, UV ray 99% cut, the visible light transmittance of 70% or more performance

The wavelength range of sunlight that it feels the hottest is said to be near-infrared in the range of 900nm to 1100nm. However, most of the infrared cut materials used by other glass coat manufacturers in Japan are heat-shielding nanomaterials called ATO, and it is known that near-infrared cuts are only around 50%. Some of the other glass coat manufacturers have misleading explanations because they use the 90% labeling for the entire infrared wavelength range. This means 90% cut (up to 2500nm) in the entire infrared wavelength range, including far infrared rays, which is different from the most important near infrared cut rate in summer. In the sketch, CTO is used as a material to cut this near infrared ray by 80% or more. In addition, by using a special dedicated roller, we have succeeded in demonstrating the effect of near-infrared cuts up to 90%. In September 2019, we launched "IRUV cut coat H-SC".

2、The above performance can be proved by applying the actual window glass, not the performance value of the sample glass. With the split type optical characteristic device, the actual coated surface and the uncoated surface can be measured.

Other company's glass coat products only explain the infrared cut value in the catalog, but the actual measurement value is not proven. It is important to verify that the actual post-application performance is the same as the infrared cut value in the catalog by holding an optical characteristic device.

3、We can see 2m x 2m (4㎡ or more) coated window glass without any unevenness, and the IR cut must be within 3% no matter where you measure.

Sponge or Dripping application make it difficult to keep the performance constant.

By coating evenly across the length and width of the roller application, the performance value is within 3% of the IR cut no matter where you measure.

4、10 years of re-application guarantee is possible, and in the event that peeling, cloudiness, or yellowing occurs without the responsibility of the customer, the application is guaranteed for 10 years from the date of completion of the application at the time of delivery.

5、Responsible construction is performed by certified coating application personnel under the coating application technology certification system. In Japan, we have a coating application certification system, called IRUV cut coat 3 Meister system. In situations where the level of coating application technology of the worker is unknown, requesting coating application will make the customer nervous. Authorized applicators who have passed the 3 Meister test can provide customers with a stable finish and performance.

6、Providing users with proper explanations on IRUV cut coat product knowledge, technical data, performance proofs, coating application results, etc. Information on the website is open to the public and anyone can confirm any questions.

Only genuine products that meet the above requirements will win in the future. Currently, most of Japan's thermal insulated glass coating products do not meet the above requirements.

《Is the IRUV cut coat business a big profit model in the future?》

1、Did you know that the most important thing in building insulation and dew condensation countermeasures is to deal with window glass that has the most heat in and out?

2、More than 90% of existing buildings in Japan are equipped with normal single glass without energy saving measures. Even if the inner window sash is changed from a single glass to a double glazing, or even if it is originally a double glazing, it will not be a measure against heat insulation in summer unless it is exchanged to Low-E double glazing.

Low-E double glazing glass and the inner window sash, the installation cost of square meter is as high as 40,000 yen to 50,000 yen, it takes installment cost of about 1 million for 20 square meters. Furthermore, the UV cut of Low-E double glazing glass is about 70%. The inner window sash and double glazing have almost no UV cut.

3、In contrast, IRUV cut coats can be easily applied to existing window glass by roller construction, as well as summer heat shield measures, winter condensation measures, heat escape measures from windows, and UV measures (UV cut 99 %) is effective. The most attractive point is that the application cost is 12,000 yen per square meter and a 10-year re-application guarantee is included.

Inner window sashes and Low-E double glass are installed at a price of 40,000 to 50,000 yen per square meter, and IRUV cut coat is a quarter of the installment price. In addition, the heat insulation performance is incomparably high, and the UV cut is 99% or more.

Due to the low construction price and good heat shielding performance, it is easy for customers to adopt, and it is clear and understandable if you feel the temperature compared with double glass, float glass and IRUV cut coat coated glass.

IRUV cut coat business development in Japan so far

What kind of company is Sketch and SETSUDEN ECO SHOP ? Sketch Co., Ltd. is the world's No. 1 manufacturer of IRUV cut coats with over 1 million square meters of construction, with sales in 34 countries worldwide (14 of which are exclusive agents). SETSUDEN (power-saving) ECO SHOP Co., Ltd. is a sales outlet for Sketch Inc. in Japan. It is also a developer of water-based paints and coatings.

In 2008, ECO Business Club Headquarters Co., Ltd. was established as a nationwide applicator organization for IRUV cut coat. Jointly promoted sales promotion with a 10-year re-application guarantee at a unified coating application price of 6000 JPY/sqm nationwide, jointly with more than 100 coating application distributors nationwide. Coating application alliances with listed companies, major general contractors, and FC headquarters, and appealing a reliable network of over 100 application distributors organization nationwide.

In 2010, Established a SETSUDEN ECO SHOP Co., Ltd. as material wholesaler. HOT guard (IRUV cut coat) 40m² application package starts selling the industry's first material for 100,000 yen. In the wake of the Great East Japan Earthquake in 2011, the number of dealers increased rapidly.

In response to requests from Domestic distributors, the ECO Business Club also raised the application price from 6,000 yen to 12,000 yen or more per sqm in response to a special demand for power saving caused by the Great East Japan Earthquake in 2011.

Despite the increase in application price, there was a request for application of more than **250,000 sqm** nationwide in a year. It has been introduced in specialized magazines with over **70%** industry share in Japan.

Sketch's IRUV cut coat has been certified as a product for overseas support in Tokyo since 2013, and has been supported by JETRO.

Japan ECO business club, in order representative Shimada has retired as president, to focus on overseas business of the sketch, start the sales expansion from domestic to foreign countries.

Since 2012, the number of IRUV cut coat application requests has drastically decreased with the end of the national subsidy for heat shield glass replacement. The reason for the drastic reduction was the fact that the price increase from the application price eliminated the price differentiation from competitors. From 2008 to 2012, 1 sqm was 6000 yen for 5 years, and the ECO Business Club succeeded in branding with a nationwide application system and became known throughout Japan. However, since the application price was raised to 12,000 yen or more per sqm, the brand power of the ECO Business Club declined and the differentiation from other companies was completely disrupted.

In 2019

In office buildings, we will develop a plan of 8800 yen per sqm that can be depreciated over 5 years as a power saving measure.

For private housing, the application area is smaller than that of corporations, so we aim to acquire the application for 12,000 yen per sqm with the energy-saving health ECO house brand. In the case of private homes, we will proceed with application and sales focusing on measures against heat shielding, harmful ultraviolet rays, and condensation, more than measures to save electricity.

In addition, we will continue to develop proposals in combination with floor heating as a differentiating strategy of the "living comfort renovation plan", which is a set of insulation and health promotion paint on the ceiling of the living room. For companies, the "Office Power Saving Renovation Plan" is differentiated with the main focus on power saving measures by applying window insulation "IRUV cut coat" and around the rooftop outdoor unit with heat shielding coating + anti-fouling coating "Outdoor Unit Cover Coat PLUS" We will develop with strategy.

Why is the IRUV cut coat developed by Sketch a No. 1 product in the world?

A.1. First of all, heat insulation performance is the world's No. 1.

Thermal insulation performance depends on which of thermal insulation nanomaterials ATO, ITO, CTO, etc. are used. Most of the other companies currently on the market use ATO with a near-infrared cut rate of around 50%. ITO is rarely used because its material cost is more than five times that of ATO. The sketch uses a CTO that significantly cuts the near infrared 900 to 1,100 nm, which is considered to be the hottest direct heat in the summer. As a result, a near-infrared cut rate of 90% (= IRUV cut coat H-SC) was achieved.

The heat insulation performance is No.1, and the application price is 8800 yen per sqm for corporations, which is cheaper than other companies' glass coats. Therefore, it can amortization period is reduced to less than 5 years. In a temperature comparison test with competitors after application, it was proved that the room temperature was 6 °C lower than the products of other companies.

A.2. Easy application by Roller and Constant performance quality

1. The difference between the glass coating products of other companies and the application is the leveling property that even the first person can coat cleanly and without unevenness by roller. As an example of overseas customers, there are cases that only IRUV cut coat samples were purchased and watched on Youtube videos. Then they could succeed to apply without any training from Sketch.
2. The glass coating products of other companies are very difficult to learn about the application technology compared to (1) spray gun method, (2) dripping method, (3) sponge bar method. This is a difficult application method that can not be applied uniformly without taking one week or more of coating application training. SKETCH's IRUV cut coat can be easily peeled off with a remover liquid in the unlikely event that application fails.
3. Rollers can be easily installed even with large window glass of 4 m² or more. However, in the application of other companies' products, uneven coating tends to occur and application is difficult.
4. Based on over 20 years of experience, technical data, application know-how, sales promotion tools, manuals, and web support (English, Chinese, Japanese) have been established. All materials, videos and pamphlets are posted on the web and can be downloaded freely.

A.3. Application record is World No. 1.

Annual sales of about 200,000 square meters of materials. Material cost is also provided in the industry lowest price.

No.1 share in Japan (industry magazine), sold to 33 countries around the world, and has a application record of over 1 million sqm. Naturally, the amount of materials sold is the No.1 in the world. Overseas sales results so far include China, South Korea, Taiwan, Philippines, Vietnam, Malaysia, Singapore, Indonesia, Thailand, Cambodia, New Zealand, Australia, India, Dubai, Qatar, Azerbaijan, Italy, Poland, USA, Canada, Brazil etc.

A.4. The big selling point is that the application price is cheaper than 3M high insulation film and the IRUV cut coat is also higher in heat shielding performance than 3M film.

- ① A 3M high-performance Heat insulated film costs about 16,000 yen per sqm in Japan. On the other hand, IRUV cut coats are cheap at 8800 yen (corporate building) to 12000 yen (private house) per sqm.
- ② The durability of window film is for about 5-7 years, but the durability of IRUV Cut Coat is for 15 years
- ③ The 10-years application warranty is safe for customers. The window film will become cloudy, yellowed and peeled off within 10 years.
- ④ The cost of 3M high-performance heat-shielding film is about 5000 yen per sqm in Japan, and a loss of 20% occurs during installation, so the cost of 1 sqm is about 6000 yen. For IRUV cut coats, the cost of a 1 sqm material is about 2000 yen per sqm in Japan (less than 1000 yen overseas).

The difference between high performance thermal barrier film and IRUV cut coat is as follows.

- The IRUV cut coat with 90% near-infrared cut is superior in heat shielding performance.
- IRUV cut coat has 15 years durability more than double that of film.
- Material cost is 1/4 of IRUV cut coat of high-performance film (in Japan)
- IRUV cut coat has almost no reflection, so the scenery outside at night is beautiful. The highly reflective film makes it difficult to see the outside scenery at night.
- IRUV cut coat has no scattering prevention function.
- High-performance thermal barrier films have a higher possibility of thermal cracking than IRUV cut coats.
- The IRUV cut coat is highly effective in preventing dew condensation in the winter, and it also has the advantage of not letting out the heat from indoor heating.
- IRUV cut coat has high performance and low application price, so you can amortize the application cost in 5 years.

A.6. Sketch's IRUV cut coat is ideal for LOW-E double glazing glass as well as normal single glass.

Low-E double glazing glass and heat-reflective glass are not competing products, but are products with a synergistic effect to improve heat insulation performance. The UV cut rate of Low-E double glazing glass can also be improved from about 70% to 99%. In the service industry, if the room is hot even if Low-E double glazing glass is installed, customer's requests will increase. For double glazing glass, applying IRUV cut coat provides the same thermal insulation performance as Low-E double glazing glass.

Product Knowledge Q & A

Q.1. What is a thermal insulated glass coat for window glass?

A.1. By installing a roller from the inside of the window glass, it prevents direct sunlight from entering in the summer and at the same time prevents indoor heat from escaping from the window in the winter. Air conditioning costs can be reduced by 25-30% by reducing the air conditioning load. A thermal barrier glass coat that cuts both infrared and ultraviolet rays.

Q.2. What are the features?

A2. In the summer, when the solar heat hits the window glass, about 60% of the solar heat is absorbed by the window glass coated with IRUV cut coat, and nearly 40% of the heat absorbed by 60% of the heat is re-radiated to the outside. It shields direct solar heat from 5 °C to 15 °C. The temperature goes down 2 to 3 °C throughout the room.

Q.3. What is the cutting rate of infrared rays?

A, Regarding infrared, the wavelength range of the direct heat of the hot summer sun is said to be near infrared. IRUV cut coat H-SP has a near infrared cut rate of 80% or more, and IRUV cut coat H-SC has a near infrared cut rate of 90%.

Most other glass coats have a near-infrared cut of 50% or less. Please note that the cut rate of 90% or more of far-infrared rays that hits the heating heat in winter is described as infrared rays, and that it may be misleadingly explained as if it has high heat-shielding properties in summer. The IRUV cut coat will not let the heat of the winter heat escape from the window.

Q.4. Is there a UV cut? How can I check if the UV is cut?

A.1. The IRUV cut coat manufactured by SKETCH has a UV cut rate of over 99%. As a result, the following effects can be expected.

- Prevents UV degradation of flooring. Prevent fading of display products such as clothes and bags,
- Prevents spots and freckles that are UV damage to skin
- Effects of flying insects with compound eyes (fly, cockroach, bee, ant, moth, dragonfly, etc.)

A.2. If you measure a glass surface that is not coated with a UV meter (market price 20,000 yen to 100,000 yen), you can see that it is UV cut by over 99%.

Q.5. Is it effective in preventing condensation?

A.1. Condensation cannot be stopped, but it can be suppressed by 50% or more. In the Hokkaido area, it is coated to prevent condensation in the winter and to prevent the escape of indoor heating heat. Condensation occurs and turns white, but water drops are extremely reduced. There are fewer chill zones in the window.

A.2. By applying this coating, two changes occur. One is that the coated surface becomes water-repellent and the contact angle increases to 65 degrees, which greatly increases the water retention of one drop of water, making it difficult for water to drip. In addition, the surface temperature rises because heat is absorbed by the window glass coated with heating heat. As a result, condensation is less likely to occur, and even if condensation occurs, evaporation occurs faster. With this heat retention effect, the winter window cooling zone is reduced, and the heat escape is extremely reduced, improving the efficiency of heating.

Q.6. Are there any documents that prove winter insulation?

A. Thermal conductivity is used as an index to measure the thermal insulation in winter. There is data that the value of coated glass is smaller than that of single plate glass. The coated glass is $5.3W / m^2$ and the uncoated single glass is $6.0W / m^2 \cdot K$. In cold regions of Japan, there is actually a thermal insulation effect, and application has become popular due to the suppression of condensation. A Japanese customer also received a thank-you call because the winter heating costs have been reduced.

Q.7. Which time of day is the most heat-insulated in summer?

A.1. The direct solar heat enters the room most in the morning on the east, noon on the west, and in the evening, but the coated surface is shielded from $5^{\circ}C$ to $15^{\circ}C$ against the uncoated surface. There is not much difference on the surface where direct sunlight does not enter. From 10am to 16pm, where the air conditioner is most loaded, the higher the temperature, the greater the heat shield width. There are a lot of temperature measurement data so far, and the temperature difference data can be confirmed in the data.

Q.8. Does the coated glass not heat crack?

A. There is no thermal cracking in single glass or pair glass. Thermal cracks are also calculated in the technical test. However, netted glass and heat-absorbing glass are inherently fragile, so in this case there is a possibility of thermal cracking, but the film and other coatings are all the same. However, since the coated film thickness is as thin as 8 microns, the possibility of thermal cracking due to the difference in thermal expansion coefficient is less than that of the film.

Q.9. Is there a color? Is it not dark?

A. The color is almost transparent. Actually, the visible light transmittance (transparency) is almost 10-15% lower than before coating. Visible light transmittance of automobile windshield is about 70%, but this coating material is about 75% ~, is more transparent than car windshield, and actually looks almost transparent.

Q.10. What is SC value

A. SC=Shading Coefficient. If the solar radiation entering on the surface of a 3mm single glass is 1.0, the ratio of the amount of heat flowing into the room is shown. The smaller the value is 1.0, the more the solar heat is shielded compared to 3mm single glass. This means that the equal cooling load is reduced.

Q.11. How many years can the application fee be amortized by reducing the electricity bill (air conditioner bill)?

A.1. In the case of a corporate building, the construction price is 8800 yen per square meter in Japan, and 25% of air conditioning costs are saved annually. Revenue simulation can be performed by examining the actual temperature difference data in the demonstration application. This product has been certified 25.7% to 31.6% in the ETV demonstration test of the Ministry of the Environment. please confirm.

Q.12, How many years is durability of the IRUV Cut Coat application?

What happens after that?

- A.1. It has a durability of 15 years or more after one application. (In the case of indoor coating application.) When the UV cut rate is over 15 years, little by little deteriorated and the acrylic resin turns white gradually, so it will be peeled off by remover and re-application. It is more than twice as durable as window film. Other companies glass coating product is for the quality of the material is poor, there is a case to be white in 3~5 years.
- A.2. The thermal insulation performance is 100% until the film is peeled off without deterioration because the infrared-cut nanomaterial CTO is completely inorganic.

Q.13, What is the basis for the annual energy saving rate of 10%?

- A.1 The Ministry of the Environment's demonstration test ETV proved that it saves 31.6% annually in private homes and 25.7% in offices. In addition, there is data on energy saving of 10% at a temperature difference of 1 degree in the technical data of TEPCO This glass coat reduces the air conditioning load by 2 to 3 degrees for the entire room temperature. In other words, it is 20-30% energy saving.

Q.14, Do you have a need for an insulating glass coat?

- A.1. (Individual needs) ... In the case of private homes, there are no application request to save energy or reduce CO2.

- ①、The room is hot because direct heat is entering into the room through the window glass.
- ②、Condensation is too severe and mold is growing. The window area is cold.
- ③、Products and figurines are burned with ultraviolet rays. UV cut countermeasures such as spots, freckles, and rough skin.

- A.2. (Corporate needs) ... There are two patterns for requests from companies.

- ①、Cases that are dealt with by customers claiming that direct heat is hot, especially in the service industry. Or a case where condensation is severe and you want to solve it.
- ②、This is a case where there is a request from a listed company regarding whether there is a cost-effective product that can be depreciated within 5 years.

Q.15, What are the competitive or similar products?

- A.1. · For glass, low-E double glazing glass, IR reflection glass, IR absorption glass, double glazing glass
- For window film, 3M finest transparent thermal barrier film
- With the same glass coating solution, the heat shielding material is ATO's competitor's product. (For details, please see the product overview.)

Q.16. What is the difference from film?

A.1. There are 4 types of film. One is a crime prevention film, which is a thick type of 200 to 350 microns. The second is an anti-scattering film with UV cut. The third is a colored sunshine adjustment film with UV cut. The fourth is a transparent thermal barrier film and an anti-scattering film. Of these, the fourth transparent thermal barrier film is a competitive product.

First, the UV cut rate of the film is 99%, which is almost the same as IRUV cut coat. The film is winning is that there is an anti-scattering effect.

Other than that, IRUV cut coat has the following advantages.

- ① The application price is low. (Japan) 8800 yen to 12000 yen / m².
Insulated window film is 15,000 yen to 20,000 yen / m²
- ② The durability is more than doubled and the weather resistance test is over 10 years.
Film is durable for 5-7 years
- ③ Easy to install and easy to peel off.
- ④ There are no joints like film.
- ⑤ There is no nighttime reflection.
- ⑥ Thermal cracking is less likely than film.
- ⑦ winter of condensation suppression effect is high, it does not escape the indoor heating heat.

Q.17. What is the difference from Low-E double glazing glass?

A.1. Japanese low-E double glazing glass has 25% to 35% sunlight reflection and 25% to 30% absorption. It is currently the best product in terms of heat insulation performance consisting of an air layer. On the other hand, IRUV cut coat has about 6% of sunlight reflection (almost the same reflectivity as single glass). The absorbed heat is re-radiated by 2/3 of the incident angle.

In winter, the IRUV cut coat can prevent the warm heat in the room from escaping to the cold, and there is almost no reflection against the heat of sunlight. It is very effective against this. Naturally, in the summer, the IRUV cut coat has no reflection, and the Low-E double glazing glass has strong reflection, so It has better heat insulation performance than IRUV Cut Coat in Japan. The UV cut of Low-E double glazing glass is about 60%, and IRUV cut coat is about 99%.

Coating Application Q&A

Q.1. There is an odor during coating application, but how long does it disappear?

- A.1. After installation, after the surface of the coating is dried (30 minutes in summer, 1 hour in winter), the odor disappears in 2 to 3 hours with the window fully open. If the window cannot be opened or closed, it may remain until the next day. For this reason, if you are worried about the odor after application, deodorize with negative ion or ozone generator.
- A.2. Since it is solvent-based, there is a smell of nail polish remover. The odor disappears over time. However, for several hours after the application until the surface is dried, ventilation is not possible, so the smell fills the room in the case of small narrow space.
Please take a consent to the customer in advance that.

Q.2, Is it safe to lick children and pets by mistake? Does the ingredient contain harmful substances?

A.1. It is a problem if you drink the paint liquid as it is, but there is no problem if you lick it after it dries. That kind of problem has never happened so far, please look at the product safety data.

A.2. Ingredients do not include 14 items of TVOC. There is no elution of formaldehyde, acetaldehyde, toluene, xylene, benzene, etc. after application.

Q.3, Isn't there uneven coating?

A.1. By applying the roller, it can be applied uniformly, has high visible light transmittance, and has good leveling characteristics, so there is almost no unevenness. The highest leveling in the industry. Overseas, 3 days of an application training allows an application of large window glass, which is the best reason in the world.

Q.4. · Is it not scratched?

A.1. The hardness of the pencil hardness test is 4H. So if it is a level that does not damage the glass, it will not be damaged.

Q.5, What are the important points in application training?

A.1. The IRUV cut coat can be applied easily for the first time if the window size is about 1 sqm. Actually, the most important practice is a large window glass of 4 sqm or more.

A.2. After that, it is important to be able to work on the actual site while understanding the difference in window size, temperature, humidity, and environment. If you apply 100 m² per person, you will solve any kind of application problem.

Q.6, What about care after application? What are the precautions for cleaning the window glass?

A, Complete curing takes half a month in summer and one month in winter, so be sure to clean it after one month.

Also, because it is only vulnerable to caustic soda (alkaline), clean the window with water or neutral detergent only. Please note that if there are any problems with cleaning with other ingredients, the application is not covered by the warranty.

Q.7, What kind of case is guaranteed for application?

A. In Japan, an application is guaranteed free of charge if yellowing, cloudiness, or peeling occurs within 10 years, not by the customer's negligence. However, outside application and an application on the film are not covered by the compensation.

Q.8, How long does it dry?

A, Finger contact drying from 30 to 60 minutes, is safe to touch after 3 hours.

Q.9, How is the sash part installed?

A, Apply 4mm masking tape to the glass surface of the sash frame. In the unlikely event that it peels off, a scraper will be used, so leave a little gap in order not to damage the sealing.

Q.10, Why the inner window? Is it possible to apply an outside window?

A, Although it can be installed outside, for example, it may not be possible on a rainy day, or it may be expensive to install a scaffold for a high glassy window. In addition, even if it is applied, it cannot be guaranteed due to the problem of acid rain, so if you give priority to price, durability or warranty, we recommend an interior window application. Nearly 10% of the total application is from outside.

Q.11, Isn't it cold in the winter without entering the heat of the sun?

A. Once the sun's heat enters the room and the room gets warmer, the heat will not escape from the window, making it warmer than the room without application.

Heat flows from the warmer side to the colder side, but in winter, the room is warm and the outside is colder. Naturally, the warm air in the room tries to escape outside through the window. When IRUV cut coat is applied, the indoor heating heat is once absorbed by the coat surface, and about 2/3 of the absorbed heat is re-radiated to the indoor side. The window cooling zone is reduced, and the dew condensation suppression effect is close to 50%.