

## Points to choose a products of thermal barrier insulation glass coating for energy-saving measures

For all customers who need our support to success your thermal barrier coating projects

- 1) Knowledge of Products ( Product description )
- 2) Thermal insulation effect in summer
- 3) Thermal insulation effect in winter  $\Rightarrow$  condensation prevention function
- 4) Comparison to other products : Application
- 5) Comparison to other products : Performance
- 6) The difference of thermal barrier materials such as ATO, CTO and ITO.
- 7) Comparison of Thermal barrier performance and price
- 8) Compare to other products
- 9) Compare to other products : Verification after application
- 10) Compare to other products : SKETCH support program

## For all customers who need our support to success your thermal barrier coating projects

Currently, it has been attracting attention to thermal barrier glass coat as global warming measurement. By applying a thermal barrier glass coating to glass-walled building, we aim to reduce air conditioning costs 20 percent to 30 percent.

In Japan, it became a power shortage in eastern Japan, Tohoku because there was an Fukushima nuclear power plant accident after the earthquake on March 11, 2011. At that time, Thermal barrier coating applied to save energy on the building windows. From that time, the thermal barrier insulating glass coat of Japan became popular to all over the world because energy-saving effect is high.

In 2016, There are 10 several companies of thermal barrier maker in Japan, and three companies in China.

However, the customer does not know what the manufacturer of the product is excellent. So it is important to convey to the consumer to know the superior surface of the product by comparing the cost and performance and construction methods from every angle.

SKETCH will support the company which starts a new thermal barrier insulation glass coating business how to promote the coating to the customer.

The most important point is the comparison of the thermal barrier performance. Thermal barrier material, ATO has been the most sold currently. However, the heat shield is not enough at the place where people feel the hot. In the equator, **the infrared cut-off rate of around 80% H-SP**, is the suitable compare to the infrared cut 50 percent of the ATO.

Thermal barrier material of SKETCH is **CTO**. Because these cost is higher than ATO material cost and still need time to develop, other companies do not use them. About price, these compared with ATO is about 150 yen higher in the material cost of the square meter, but it does not affect most of the application price and profit margins. The payback period of CTO and CTO-I is two to three years shorter than ATO because thermal barrier performance is superior about energy-saving rate of the air-conditioning costs after application.

Then, the roller application of SKETCH does not have coating unevenness.

Modify in application process is also a simple, thermal barrier performance is uniform. In particular, since glass coat of other companies applied to the large window glass of a height of more than 3m is difficult, the product of SKETCH will be advantageous.

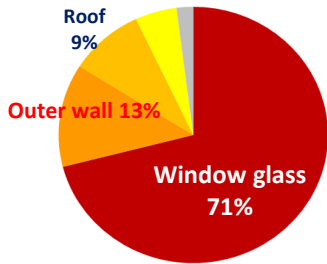
**Sketch was sold insulation coat 1 million square meters worth to the world 20 countries.**

We know any details of thermal insulation coat, and advise on appropriate sales methods. We can introduce the superiority of SKETCH product such as in the finish after the application, the thermal barrier performance and application method.

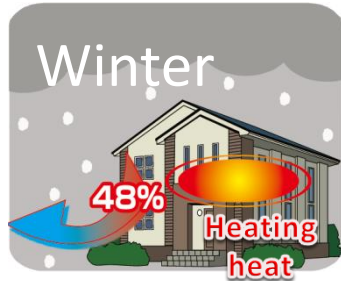
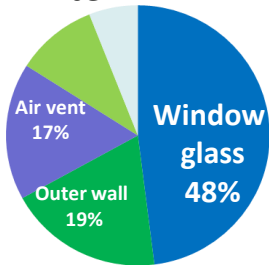
And when you have the knowledge of SKETCH products, you can compare with other companies products using ATO. Currently, **CTO** is not well known. So we will show you how to compare the products before you start the business of Thermal Barrier coating, and learn how to compare the performance and application method with other companies. And let's promote SKETCH coating together. In this way, you can save the investment and your valuable time.

**Since June 2016, we will apply the insulation coating with 3,900JPY per 1sqm** and propose new business plan, three years payback plan. For those who want to start the insulation coat business of SKETCH, we will introduce the product knowledge, Roller application and verification methods, and continue to support your business. First of all, please consider the distributorship after reading this document.

# 71% of Heat enters from the window glass in Summer



# 48% of Heat escapes from the window glass in winter



## 1) Knowledge of Products ( Products description)

1) Summer enters 72% solar heat from the window, winter escape 42% Heating heat from the window.

It is effective for reduction of air conditioning costs by applying to the window glass. When the area of the window glass is large such as buildings, it enter the solar heat especially in the summer and during the day.

2) The summer and during the daytime when the solar heat is hot, the temperature difference is large between coated and non-coated surface.

3) In winter, the coating cut more than 90% of indoor heating heat (far-infrared ray), and prevent to escape heat from the window. It can keep the solar heat that has entered the room during the day; the room temperature is 2-3 degrees higher after the application.

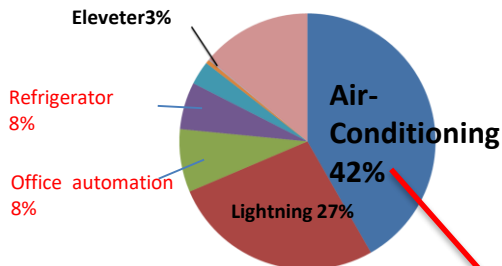
The temperature of air conditioning will be lower from 2 to 3 degrees.

4)The coating surface has high water repellency and there is a condensation deterrent effect. Moreover, the coated surface is highly endothermic, it can delay to occur the condensation because the glass increase warmth.

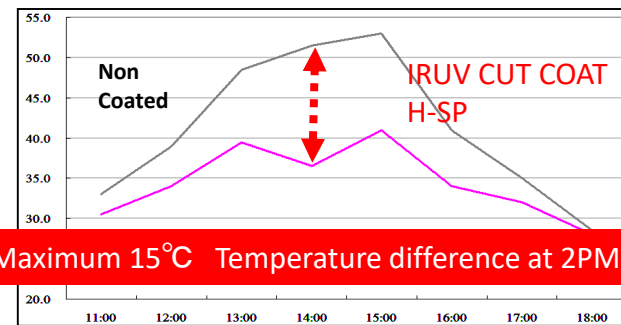
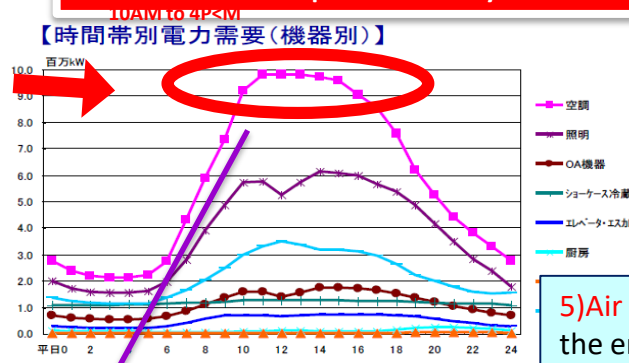
Dew condensation suppression effect is 50% or more.

## Electric power in Summer

### Demand Structure of 2PM at office building



### Demand for electric power at hourly intervals

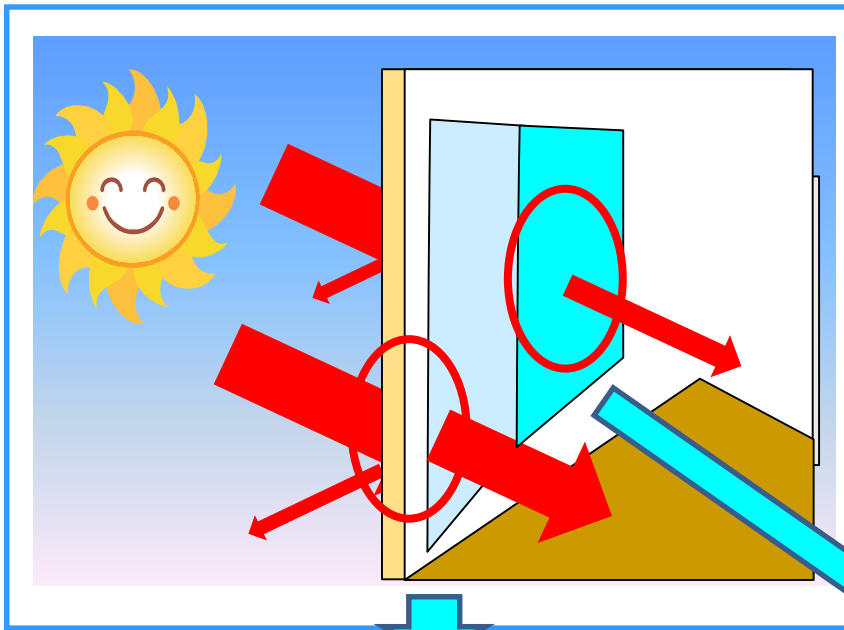


The Information From Agency for Japanese Natural Resources and Energy on May, 2011

The Point is Peak hour cut of the Air-Conditioning during 10AM to 4PM

5) Air conditioning fee is 42% of the electricity bill for the entire building. In particular, maximum bill is from 10AM to 4PM in summer. The most effective of the air conditioning cost reduction is to apply the thermal barrier insulation coat of window glass.

## 2) Thermal insulation effect in summer



1) **Cut direct sun heat (near-infrared) more than 80% in summer**

The room temperature will drop 2-3 degrees, and maximum 10 degrees or more near a window. = **Reduction of air conditioning costs is 20 to 30 percent.**

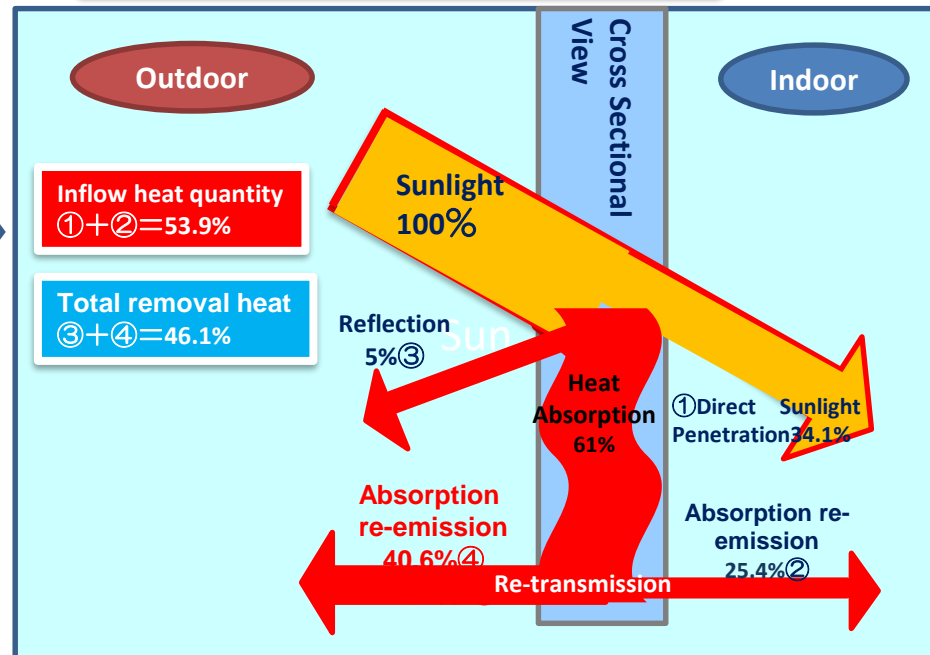
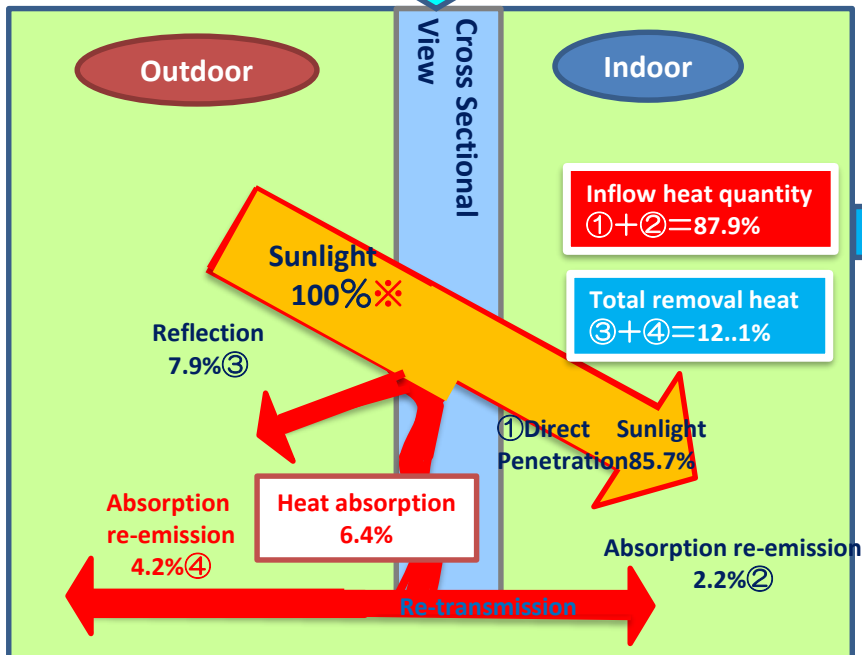
2) After IRUV CUT COAT H-SP coated, the visible light transmittance is substantially unchanged, and cut 80 % of IR (infrared) or more. To absorb the heat on the coated surface of the glass, two-thirds of the heat re-emission to the outside.

3) **99% of UV-cut**

In particular, it is ideal for strong ultraviolet such as Southeast Asian countries and Australia and New Zealand where have an ozone hole.

Prevention to faded, stains, and freckles.

### IRUV CUT COAT H-SP Performance



### 3) Thermal Insulation effect in winter ⇒ condensation prevention function

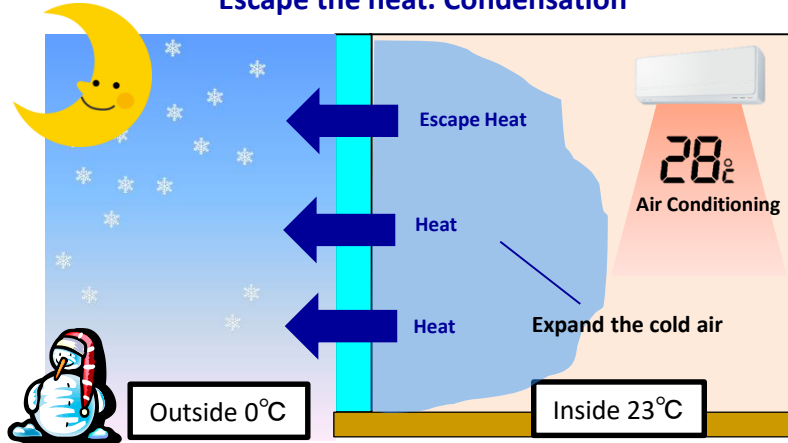
The principle of heat transfer >Heat moves from hot to a cold place.

>There are two types of heat, solar direct heat (Near-infrared) and radiant heat ,heating heat(Far-infrared) .

《Night》

#### Before application

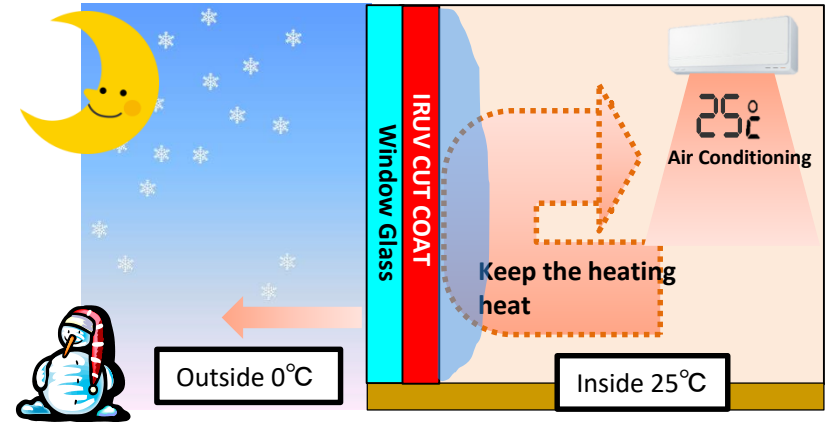
Escape the heat. Condensation



- ① Turn on the heating, warmed air will escape from the window because the temperature of the window is very low.
- ② Moisture in the room adheres to the cold window, then it is wet with condensation.

《Night》

#### After Application



- ① Turn on the heating, coating is absorbed the heat and two-thirds of the absorbed heat does not escape, even if lowering the set temperature of the air conditioning warm.
- ② The window becomes warmer after application and the windowpane absorbs the heat, Then the condensation will be reduces.

#### The window becomes warm, and a condensation suppression effect

##### Before Application

2007/10/19

High condensation until 3pm. The window becomes frozen when it is a cold day in winter. Even the window can not open.



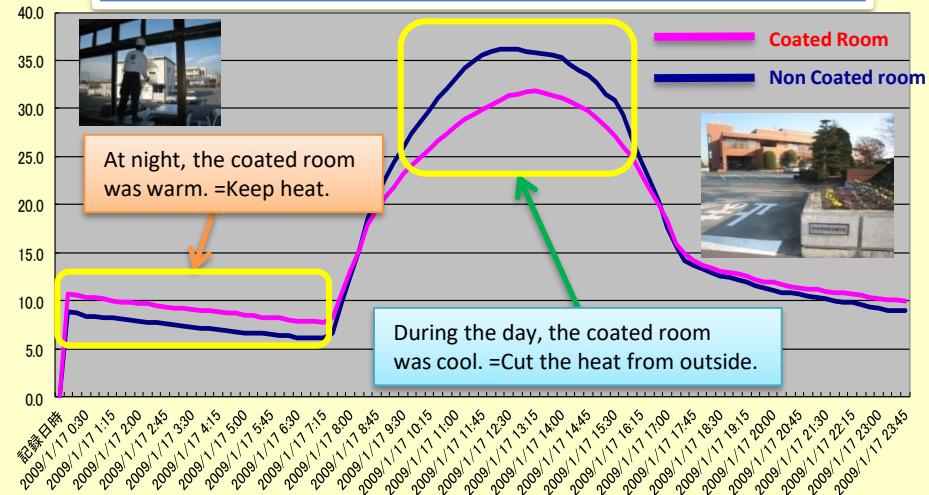
##### After Application

2007/10/21

It is obviously improved to reduce the condensation during the day time.



#### Government building in Yamanashi, winter temperature measurement results



# Its Brand-new big market to be able to applying easily for existing buildings

## Compare with 3M Thermal insulating transparency film.

A material cost of a Cheap film is comparatively ¥1500/m<sup>2</sup>. Construction cost is more than ¥4000.

And Durability is 5years to 10years that is guideline to exchange new one.

Cost of IRUV Cut Coat is cheaper than film in every way , and Durability is better than film ,in spite of very high quality of UV cut ,IR cut

After applying to normal glass , it gets same effect as well as a Low-E Pair Glass.

It can apply 40m<sup>2</sup>/kg, High transparency and difficult to make Coating spots, it's easy to perform reapplying.

It has many merit to apply . A quality of Heat insulation is World No,1 that is to cut off **80% of IR rays** and **99% of Ultra Violet rays**

It can apply Low-E pair Glass to get higher quality of heat insulation besides normal single glass and pair glass.

①Yellowing & exfoliation



②heating crack



③strain view



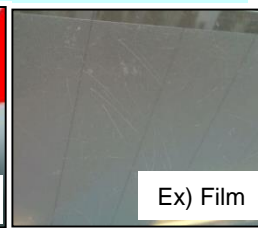
④reflection view



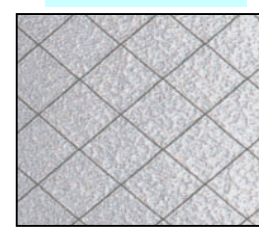
⑤Line of cutting



⑥easy fragile



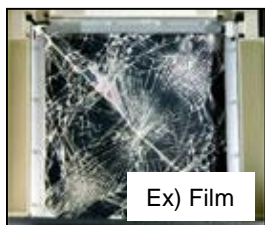
⑦ applying for uneven glass



⑧Construction price



⑨ant scattering



### The demerit of the high quality film

- ①Durability is short in 5~7 years
  - ② Easy to heat cracking
  - ③ Distortion of the landscape stand out
  - ④ It is hard to see the night view because of reflection
  - ⑤It can see Joint line at big glass.
  - ⑥ Surface hardness H~2H ,Easily scratched
  - ⑦It cant apply uneven glass.
  - ⑧Application cost is more than 15,000JPY per 1sqm.
- The merit of the high quality film
- ⑨ There is shatterproof effect.

### The merit of IRUV CUT COAT

- ①Durability is in 15 years
- ② It is difficult to heat cracking than film
- ③There is almost no distortion of the landscape.
- ④Night, glare is not noticeable.
- ⑤There is not Joint line by roller coating.
- ⑥Surface hardness is 4H harder than film
- ⑦It can apply uneven glass
- ⑧ Application cost is about 3,000JPY~ 5,000JPY per 1sqm.

### The demerit

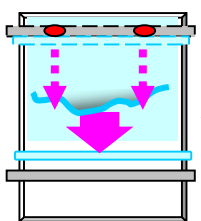
- ⑨There is no anti-scattering effect

VS

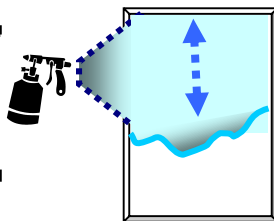
# 4) Comparison to other products: Application

## Other glass coating application method

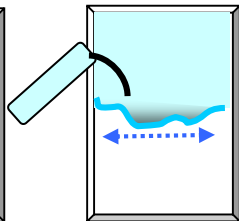
Sponge bar



Spray Gun



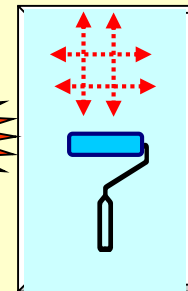
Dripping



- ☆ Thickness adjustment is not possible during the application (No mistake)
- ☆ The thickness of coating is uneven.
- ☆ No remover ⇒ Very difficult to re-apply

VS

## SKETCH Roller Application



- ☆ Thickness adjustment is possible during the application
- ☆ The thickness of coating is even ⇒ 25g per 1sqm
- ☆ Original remover. Possible to re-apply



Compared to other glass coating on April 2011. Effect was evident by comparing the actual performance

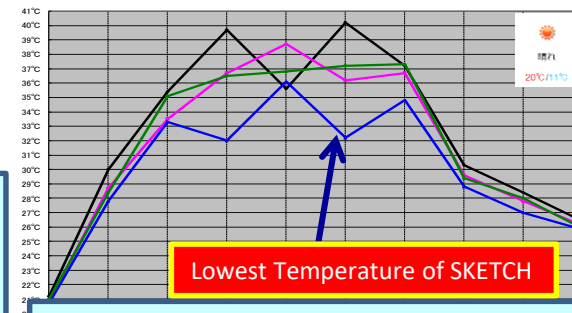


Smart coat

Sketch IRUV CUT COAT

UV shield

Three coating was applied to 4sqm of window glass, to measure the temperature in four days. IRUV had a temperature difference from 4 to 6 degrees compared to others. After the verification, 3800sqm was coated.



Temperature measurement graph  
The blue is sketch goods

## Films

- It takes time to learn the techniques of application.
- 20% of material cost is loss during the application.

VS

## IRUV CUT COAT Series

- Easy to learn the application for 2 to 3 hours..
- Only 50g of IRUV is loss during the application. This is for the roller absorption. The quantity depends on the roller.

## 5) Comparison to other products : Performance

Learn the differences of other coating application methods. It confirm the thermal barrier performance and easy uniformly application.

Note: Sometimes other products introduces the patent of the application method as material patent. Please check the patent content.

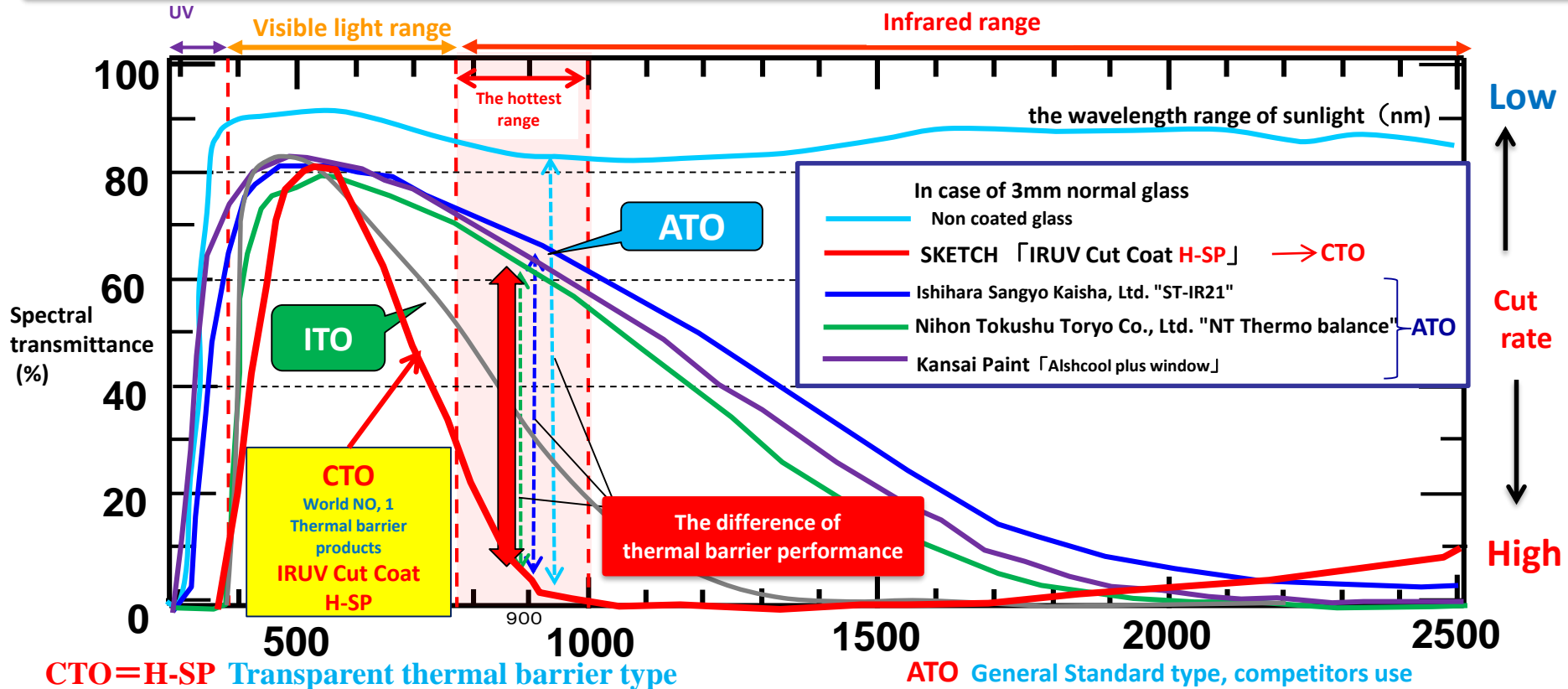
The world's first, Super-hydrophilic primer  
Simple application, no oil film taking, double application area

Application Methods	Sponge bar, Spray gun, Roller, Dripping	SKETCH Roller Application
Products	Kansai Paint = Alschool plus window Ishihara Sangyo Kaisha, Ltd. = STIR Nihon Tokushu Toryo Co., Ltd. = Thermo balance Die flex = UI shield For you = at shield clear Fumin = Fumin Coat China manufacturer ECOP = Krystal bond Asukurin = cool save Daiko technical = Eco-glass coat	SKETCH ECO SHOP IRUV CUT COAT H-SP IRUV CUT COAT HC
Application per 1person a day	15sqm to 20sqm	15 to 20sqm
Degreaser	Nessesary	Nessesary
More than 3sqm of glass	Difficult, uneveness	Easy, even thickness
Amount of 1sqm	20 ~ 25g	25g
Thermal barrier materials	Mostly ATO (90%) or ITO	CTO
IR CUT	About 50%	H-SP 80% ~ HC 70%~
Application Training	It takes time to learn the application	One day training
Others	Long preparation, uneven surface and thickness	Easy application, even application, possible to Re-apply



## 6) The difference of thermal barrier materials such as ATO, CTO and ITO

In solar energy (solar radiation), the wavelength ranges which the person feels hot is up to about 1500nm. Wavelength close to visible light (VL) (800nm ~ 1000nm) is the heat of summer. **High performance of IR cut is possible to cut the heat around 900nm.** IRUV can cut significantly around 900nm, so SKETCH uses **CTO**. But, Kansai Paint and other two companies, which are using the high cost and lower performance of ATO. The thermal barrier performance of ATO is not good enough in summer.



CTO = H-SP is, about 80% of visible light transmittance and cut 80% or more near-infrared. It is easy application and high performance. **1kg of Thermal barrier material cost is 36,000 yen.** In particular, it is ideal for hot summer and the countries of the equator. In the case of 1m<sup>2</sup> 3900 yen and 30% of the energy-saving rate, the payback period is about three years.

ATO is to cut the entire infrared evenly, balanced material. **1kg material cost is from 12000 yen to 15000 yen.** It cuts significantly more than the wavelength of 1500nm such as radiant heat coming from people and heating heat., to prevent the escaping the indoor heat from the window glass. But it is not suitable for the thermal barrier in summer.



UV CUT	100%
IR CUT	85.2%
VL transmittance	76.2%

VS



UV CUT	99.5%
IR CUT	43%
VL transmittance	85%

## 7) Comparison of Thermal barrier performance and price

Thermal barrier performance and visible light transmittance are difference by the infrared cut material such as ATO, ITO,CTO,CTO+ITO,. Therefore, you need to know which thermal barrier Nano material uses.

Also compare the material cost of square meter and application area per 1kg.

Market	90% of products in the market		3 or 5 year Payback plan
Maker	Other makers (includes SKETCH)		H-SP
Thermal barrier material	ATO	ITO	CTO
Thermal barrier price	14,000JPY/kg	80,000JPY/kg	36,000JPY/kg
Thermal barrier material : 25% of finished product Plus UV base: 75% of Finished product	3,500JPY/kg 15,000JPY/kg	20,000JPY/kg 15,000JPY/kg	9,000JPY/kg 15,000JPY/kg
Manufacture Price	<b>18,500JPY/kg</b>	<b>35,000JPY/kg</b>	<b>24,000JPY/kg</b>
Sales Price	30,000JPY/kg } 40,000JPY/kg	80,000JPY/kg } 100,000JPY/kg	25,000JPY/kg } 37,500JPY/kg
Material cost per 1sqm (1kg=40sqm)	750JPY~ 1,000JPY	2,000JPY~ 2,500JPY	625JPY~ 938JPY
Application Price per 1sqm	10,000JPY/sqm	15,000JPY/sqm	<b>3,000JPY/sqm~ ~5,000JPY/sqm</b>
Visible light transmittance	About 72%	Over 80%	<b>80%</b>
IR cut	About 50%	About 50%	<b>80%~</b>
Saving Energy(Example)	10%	10%	<b>20%~30%</b>

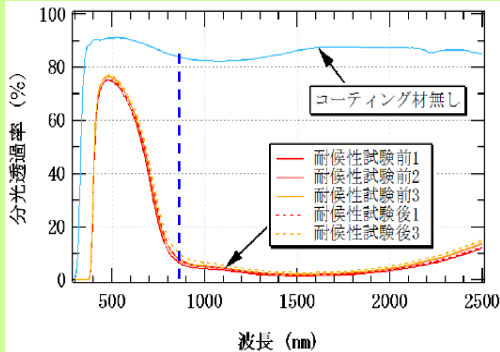
# 8) Compare to other Products

References ① Ministry of the Environment, environmental technology demonstration project ETV

Table registration companies graph List

<http://www.env.go.jp/policy/etv/field/f05/p3.html>

## SKETCH : IRUV CUT COAT H-SP



(1) 熱・光学性能及び環境負荷・維持管理等性能試験結果 (平均値) <sup>①</sup>

【実証項目】

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	遮へい係数 (-)	0.63	0.64
	熱貫流率 (W/m <sup>2</sup> ·K)	6.1	6.1

【測定項目】(参考)

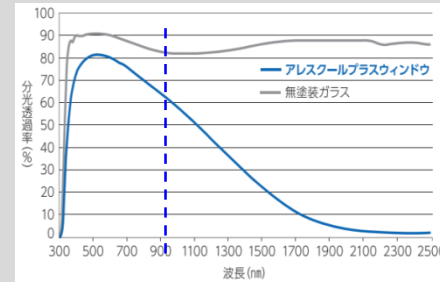
基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	可視光線透過率 (%)	70.4	71.0
	日射透過率 (%)	34.0	35.1
	日射反射率 (%)	5.3	5.0

【参考項目】

基板の厚さ	項目	耐候性試験前	耐候性試験後
8mm	遮へい係数 (-)	0.64	-
	熱貫流率 (W/m <sup>2</sup> ·K)	5.9	-
	可視光線透過率 (%)	71.0	-
	日射透過率 (%)	35.2	-
8mm	日射反射率 (%)	5.1	-

VS

## Kansai Paint "Alscool plus window" (Quote from the catalog)



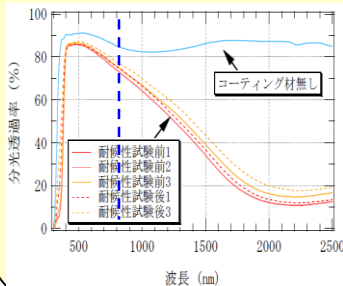
紫外線遮断率 (300-380nm)	可視光透過率 (380-780nm)	赤外線遮断率 (780-2500nm)
50%以上	80%以上	50%以上

	日射透過率 % 300-2500nm	日射反射率 % 300-2500nm	可視光透過率 % 380-780nm	紫外線透過率 % 300-380nm
アレスクールプラスウィンドウ	63.4	6.7	80.6	44.9
無塗装ガラス	86.4	5.5	90.5	71.5

Comparison	SKETCH	Kansai Paint
	IRUV CUT/UV Cut/VLT	80%/99%/75%
Thermal Barrier Products	CTO	ATO
Manufacture Price/ Sales Price	24,000JPY/25,000JPY ~ 37,500JPY	18,500JPY/~ 40,000JPY ( Estimation)
Application price per 1sqm	3,000/3,900/5,000JPY	10,000JPY ~ 12,000JPY ( Estimation)
Energy saving rate by air conditioning	20~ 30% energy saving	10% energy saving
Application Method	Apply without glass cleaner	Necessary to Glass Cleaning

## Fumin 「Fumin Coating」



(1) 熱・光学性能及び環境負荷・維持管理等性能試験結果 (平均値) <sup>①</sup>

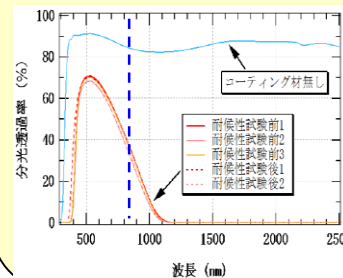
【実証項目】

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	遮へい係数 (-)	0.68	0.68
	熱貫流率 (W/m <sup>2</sup> ·K)	6.8	6.8

【測定項目】(参考)

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	可視光線透過率 (%)	64.7	65.5
	日射透過率 (%)	68.6	71.2
	日射反射率 (%)	6.7	6.8

## Ecop 「KB (Kristal Bond) 90」



(1) 熱・光学性能及び環境負荷・維持管理等性能試験結果 (平均値) <sup>①</sup>

【実証項目】

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	遮へい係数 (-)	0.66	0.65
	熱貫流率 (W/m <sup>2</sup> ·K)	5.9	5.8

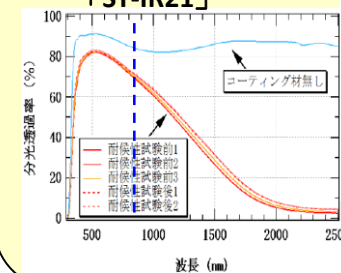
【測定項目】(参考)

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	可視光線透過率 (%)	65.3	67.7
	日射透過率 (%)	39.2	38.6
	日射反射率 (%)	6.6	5.7

【参考項目】

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	遮へい係数 (-)	0.66	-
	熱貫流率 (W/m <sup>2</sup> ·K)	5.7	-
	可視光線透過率 (%)	71.0	-
	日射透過率 (%)	39.7	-
3mm	日射反射率 (%)	5.2	-

## Ishihara Sangyo Kaisha, Ltd. 「ST-IR21」



(1) 熱・光学性能及び環境負荷・維持管理等性能試験結果 (平均値) <sup>①</sup>

【実証項目】

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	遮へい係数 (-)	0.66	0.67
	熱貫流率 (W/m <sup>2</sup> ·K)	5.9	5.9

【測定項目】(参考)

基板の厚さ	項目	耐候性試験前	耐候性試験後
3mm	可視光線透過率 (%)	61.9	62.1
	日射透過率 (%)	69.2	67.4
	日射反射率 (%)	6.7	6.3

# 9) Compare to other products: Verification after application

Application to the glass and to see if the same performance as the company's catalog.

- It cannot be determined at sample glass. Most important point is to apply more than 1 sqm and verify the performance.
- Measure the value such as IR cut, UV cut, VLT rate with the split type of optical characteristic device to coated window glass.
- Check the unevenness surface, distortion, dripping with your eyes.
- Temperature measuring coated and uncoated surface. Comparing the temperature of the day. (Using Thermocron or HLT-100BT.)
- Temperature difference comparison by an infrared sensor and infrared lamps.

## Example of Catalogs

### Kansai Paint

アルセールプラスウィンドウの特長

- 1 | 建物外観からローラーでの施工が可能
- 2 | 日射率外線を50%以上削減
- 3 | 可視光透過率を80%以上確保
- 4 | 紫外線を50%以上遮断
- 5 | 優れた耐久性

### Nihontokushutoryo

項目	標準仕様	オプション仕様
太陽放射遮蔽率 (%)	48.0	48.0
可視光透過率 (%)	80.0	80.0
紫外線透過率 (%)	50.0	50.0
赤外線透過率 (%)	90.0	90.0

### Ishihara Sangyo Kaisha, Ltd.

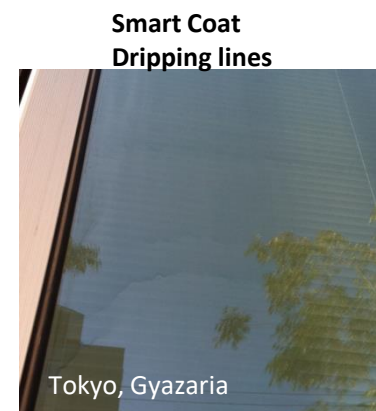
地球に優しい

1 夏は涼しく、冬暖かい  
太陽熱を25%以上カット

2 高い透明性  
可視光透過率 80%以上

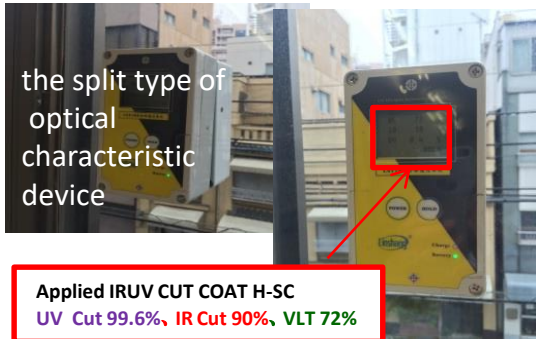
3 優れた耐久性

## Check the surface after the application

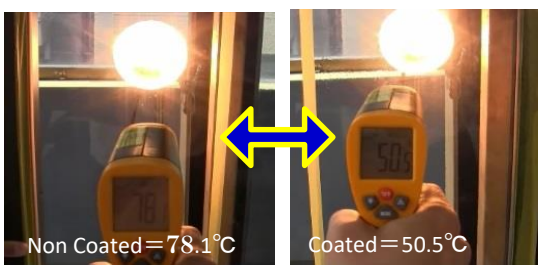


## Verification the performance after the application

① Measurement across the machine to coated glass

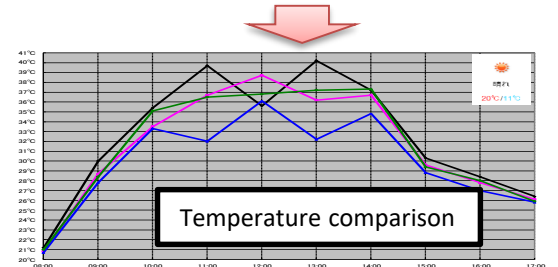
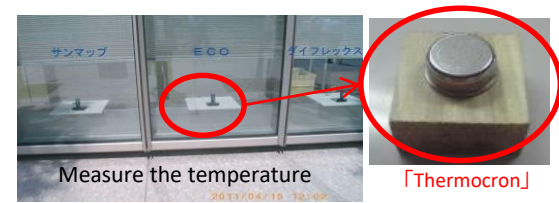


② By applying a lamp from the inside, measured at a temperature.



Temperature measurement

③ Temperature measurement for a certain period of time by Thermocron



# 10) Compare to other products : SKETCH support program

## How to achieve the application project!

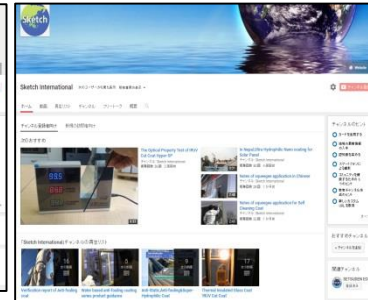
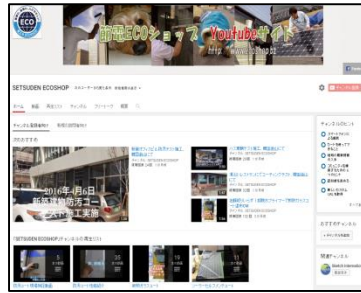
- References: Application examples, Technical data, Sales tools, manuals, Catalog and WEB support and training.
- SKETCH supports “3 to 5 years payback plan”.
- Training for sales of flow, demonstration, temperature measurement, training, and income simulation
- Videos ,YouTube, introduces products, application etc.(Japanese, English, Chinese)
- SKETCH can support seminars, exhibitions, application for a big project.

SETSUDEN ECO SHOP Web site

YouTube

Youku in China

Download all documents from web-site



YOUKU 优酷 首页 频道  
视频: 降低20% ~ 30%空调费/新时代环保产品/日本市场占有率...



<http://www.ecoshop-onlineshop.com/>

<https://www.youtube.com/channel/UC5WOqhrpZHhEl-pt6sgONZg>

<https://www.youtube.com/?hl=ja&gl=JP>

[http://v.youku.com/v\\_show/id\\_XMTQ3MzMyMDYwNA==.html](http://v.youku.com/v_show/id_XMTQ3MzMyMDYwNA==.html)

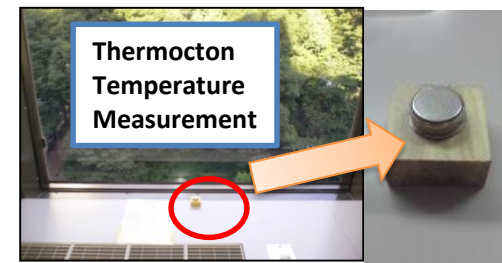
Sales training

Application

Seminar

Training for the actual site

Temperature measurement  
Saving Energy Simulation



Enter the temperature date

Calculate the temperature and make the graph

Measure the temperature differences

## IRUV CUT COAT series ENGLISH references



### Sketch Youtube Channel

<https://www.youtube.com/channel/UCUK-OQThxuvklyrsmp5C6zg>

- ① IRUV Cut Coat Product CM [https://youtu.be/dh9Tv-4y1Bc?list=PLiM3tAWz\\_R5gUEmXSMDSiKH4DDw0sWZs0](https://youtu.be/dh9Tv-4y1Bc?list=PLiM3tAWz_R5gUEmXSMDSiKH4DDw0sWZs0)
- ② Application Movie [https://youtu.be/BsVnhRIn40w?list=PLiM3tAWz\\_R5gUEmXSMDSiKH4DDw0sWZs0](https://youtu.be/BsVnhRIn40w?list=PLiM3tAWz_R5gUEmXSMDSiKH4DDw0sWZs0)
- ③ Coating for Big window glass <https://youtu.be/uoVZx3FLRY0>
- ④ failure cases <https://youtu.be/tovyylwTd28>
- ⑤ How to remove coating film <https://youtu.be/Dilf9Crep2c>
- ⑥ Temperature measurement method <https://youtu.be/LI-HH6VxmdY>



### IRUV Cut Coat Web Training Channel

[https://www.youtube.com/channel/UC5GY2Htaxtt3-epEmFxVU4Q?view\\_as=subscriber](https://www.youtube.com/channel/UC5GY2Htaxtt3-epEmFxVU4Q?view_as=subscriber)



*Sketch*

### Sketch International HP

<http://www.sketch-english.com/>

- ① IRUV CUT COAT Product Description and Comparison
- ② Distributor Price and Condition
- ③ Download of MSDS, Catalog, Application record and so on



### ECO SHOP Online Shop

<http://www.ecoshop-onlineshop-english.com/>

- ① IRUV CUT COAT 1.3million JPY application package
- ③ Download of all references as to IRUV Cut Coat