

High-speed Roll-up Door

「Insect-resistant orange sheet」

Q&A



Manufacturers improve the performance of insect-resistant sheets for High-speed Roll-up Doors. The most popular type is “Insect-resistant orange sheet”. Do you know the familiar orange sheet is having high performance and reliability in comparison to another?

We collaborate with Dainihon Jochugiku Co., Ltd who is the major company of insecticide manufacturer and well known for familiar KINCHO brand to summarize the information in common question-and-answer format.

Cooperative company : Dainihon Jochugiku Co., Ltd.

Q1 Is it true that insects are drawn to yellow and orange?

A1 This is a common theory, however the examination results showed no significant difference between orange and green even though green is well known for having higher insect-proof performance. Regarding the attractant effects on insects, it differs depending on the kind of insects and environmental condition. Therefore, there are some points which are not clearly known.

Comparison results of flying insects attracted by reflected light (When light shines on a sheet in a day time)

*To which color of sheet more insects are attracted? → No. of individuals attracted is less = Higher insect-proof performance.

	1st time		2nd time	
	Orange	Green	Orange	Green
Flies	9	12	2	0
Family chironomidae	5	3	1	0
Family psychodidae	9	5	5	5
Fruit fly	6	2	1	3
Hemiptera	7	3	20	25
Lepidoptera	1	0	0	0
Hymenoptera	1	0	6	0
Total :	38	25	35	33



The state of practical examination (outside)

Results : No significant difference was seen.

(Examination method) Hung a lantern at the center part, lined up 2 sheets each at the same height. Set up these at 3 locations where were at 1.7m(high), 1.0m(medium) and 0.3m(low). Checked the kinds and the numbers of insects trapped after an entire day and night.

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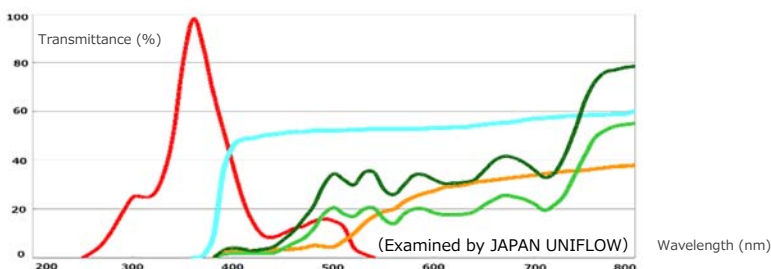
There is no significant difference compared with green and orange doesn't easily draw insects!!

Q2 In the first place, how the insect-resistant sheet prevents from insects?

A2 It prevents insects from coming flying by intercepting a wavelength that only insects can see with utilizing the habit of insects swarming around a light (UV light).

Flying insects doesn't have high visual acuity, however they recognize UV light that people cannot see and act relying on it. The reason why insects swarming around a lamp at night is that they react to the UV light of lamp. An insect-resistant sheet prevents insects from intercepting a wavelength of light which is close to UV light and insects like and makes the light invisible for insects. There is no significant difference of functions compared with orange and green.

Transmittance of insect-resistant sheet at respective wavelength



- Visual acuity of insects
- Transparent
- Insect-resistant orange
- Insect-resistant dark green
- Insect-resistant green

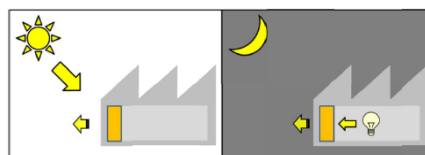
*It provides more effective insect-resistant performance where the area overlapping with the visual-acuity line of insects is smaller.

It prevents insects from coming flying by making the light invisible for insects through a sheet.

Q3 There are 2 colors of insect-resistant sheets which are orange and green. Which color of sheet provide more effective insect-proofing effect?

A3 As a result of examination, we confirmed that the orange sheet can provide more insect-proofing effect compared with green. It is especially effective in the night and characteristic that it is hard to bring flies close.

The result of comparative study assuming attractant situation on insects performed by KINCHO showed that orange sheet was harder to bring flies close than green sheet which means orange sheet can provide more insect-proofing effect.



Especially in the transmitted light (especially the light leaking from buildings in the night), the result turned out to be something to support that orange is harder than green to bring flies close. Significant difference was seen against flies at food and pharmaceutical factories.

*The situation that insects are attracted by a sheet shutter
 (Left : Reflected light, Right : Transmitted light)
 Reflected light : Light reflecting in a sheet in a day time
 Transmitted light : Light leaking from buildings in the night

The number of flying insects attracted to light were compared. (To which sheet more insects drawn and trapped)

Comparison of the numbers of individuals of flying insects attracted to transmitted light

	Average of Day 1 Number captured		Entrainment ratio (G/O)	Average of Day 2 Number captured		Entrainment ratio (G/O)	Average G/O (Entrainment ratio)	Judgment result of entrainment ratio (Insect-proofing effect)
	Orange(O)	Green(G)		Orange(O)	Green(G)			
Common house mosquito	21	53	2.5	13	35	2.7	2.6	Orange is higher
Asian tiger mosquito	20	19	1	11	18	1.6	1.3	Draw
House fly	23	72	3.1	13	95	7.3	5.2	Orange is much higher
Vinegar fly	30	51	1.7	4	22	5.5	3.6	Orange is higher
Drosophila hydei	11	12	1.1	3	10	3.3	2.2	Orange is higher
Phorid fly	10	13	1.3	2	4	-	1.3	Draw
Family psychodidae	1	0	-	0	0	-	-	-

Comparison of the numbers of individuals of flying insects attracted to reflected light

	Average of Day 1 Number captured		Entrainment ratio (G/O)	Average of Day 2 Number captured		Entrainment ratio (G/O)	Average G/O (Entrainment ratio)	Judgment result of entrainment ratio (Insect-proofing effect)
	Orange(O)	Green(G)		Orange(O)	Green(G)			
Common house mosquito	43	26	0.6	32	23	0.7	0.7	Green is higher
Asian tiger mosquito	6	3	-	13	10	0.8	0.7	Green is higher
House fly	33	62	1.9	21	37	1.8	1.8	Orange is higher
Vinegar fly	21	10	0.5	16	23	1.4	1	Draw
Drosophila hydei	3	5	-	6	10	1.7	1.7	Orange is higher
Phorid fly	12	6	0.5	9	17	1.9	1.2	Draw
Family psychodidae	1	2	-	3	2	-	-	-

Result :

Large number of insect was trapped in transmitted light.

There was no clear difference in reflected light.

Entrainment ratio(Comparison between green and orange) = The number of insects trapped by Green sheet ÷ The number of insects trapped by orange sheet.

※Entrainment ratio...Less than 1:Attracted to orange, Less than 1~1.5:No clear difference, Less than 1.5~5:Attracted to green, More than 5:Strongly attracted to green

The data was excluded when both of the number of insects trapped was less than 10.



Collected trial sheets
(Transmitted light)

Left : Green Right : Orange

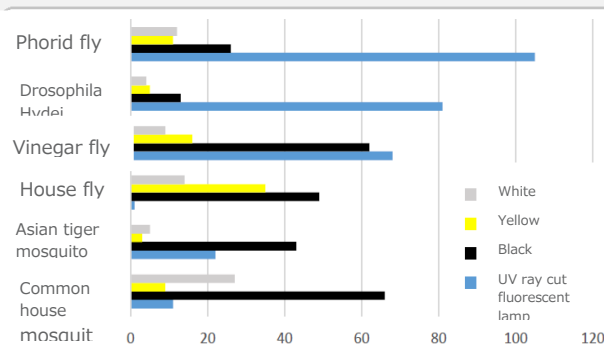
(Cooperative company : Dainihon Jochugiku Co., Ltd.)

The orange sheet is harder to bring insects close than green and can provide more insect-proofing effect compared with green!!!

Q4 I saw a product that is capable of drawing back the insects intruded indoors using yellow sheet which insects like. Is it possible?

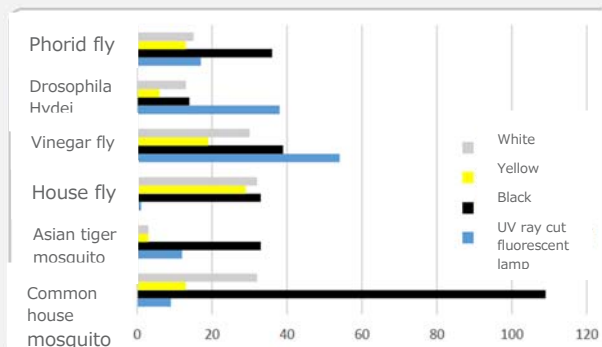
A4 According to the test result, the attracting effect of fluorescent lamp is superior to yellow color in a factory (More insects swarm) . This method is hardly realized because the difference of light source or surrounding environment has a significant influence to the attracting effect.

Comparison between ordinary fluorescent lamp and various colors of sheets



More insects swarmed around a fluorescent lamp than yellow sheet, and more insects were drawn to black than yellow.

Comparison between UV ray cut fluorescent lamp and various colors of sheets



After all, insects swarmed around a fluorescent lamp and more insects were drawn to black than yellow.

The test was performed in conditions that is assumed to be in a factory to compare the insect attractiveness between the fluorescent lamps (ordinary-type and UV ray cut-type) and the 3 colors of sheets (white · yellow · black). As a result, insects swarmed around both types of fluorescent lamps more than any color of sheet. And, more insects were drawn to white and black compared with yellow.

Therefore, (large number of insects can be recognized) drawing back insects intruded indoors with yellow sheet may not be true. There is a high possibility that they are strongly attracted to the colors in the surroundings if there was something white or black around yellow object.

【Evaluation method】

Adhesive spray coated wrap is attached to the light source and the sheet were set up in the laboratory as shown in Fig 1. Further, all the windows inside were covered with aluminum foil which hardly receives effect of sunlight or fluorescent lamp outside. The number of insects attracted and trapped were counted after turned on the light in the room after test insects were released and left there for one night.

Fluorescent lamp ①Ordinary-type
②UV ray cut-type

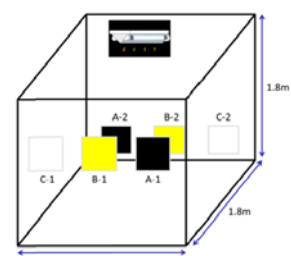


Fig 1. Locations where the test samples were set in the laboratory.
(Cooperative company : Dainihon Jochugiku Co., Ltd.)

Is it difficult to attract insects with yellow sheet because insects swarm around a fluorescent lamp or other colors?

【Summary】

**Insect-resistant orange sheet does not draw insects, it is harder than green sheet to bring flies close, especially effective in the night and against flies!
It can provide more insect-proofing effect than green.
You can be assured that this product is reliable to adopt.**