

Issuance date: August 28, 2015

Report No.: 15M-RPTJUL0221

To RAYCOP JAPAN INC.

Test Report



Institute of Tokyo Environmental Allergy, ITEA Inc.

Seidomae Bldg. 1-2-5 Yushima, Bunkyo-ku, Tokyo 113-0034

Phone: 03-3526-2031 Fax: 03-3526-2032



Test 1

- 1-1. Test name** Consideration of allergen removing effects by suctioning with a bed cleaner
- 1-2. Purpose of test** The purpose of this test is to use bed cleaner “Raycop RS2-100” to suction house dust from a pseudo-contaminated bedding (mattress pad), and then measure the amount of mite allergen remaining on the pseudo-contaminated bedding to consider the mite allergen removal effects by suctioning with “Raycop RS2-100.”

1-3. Subject

- Subject Raycop RS2-100
- Comparison No suction

1-4. Test condition

- Suction target Bedding that has been artificially contaminated with mite allergen
 Mattress pad^{*1}: Cloth cover 80% polyester, 20% cotton
 Filling material 100% polyester
^{*1} We used bedding standardly used in tests by ITEA.
- Suction mode Mattress mode
- Sprayed object House dust^{*2} (special order item, ITEA)
^{*2} This is a collection of dust gathered from the vacuum cleaner of multiple general households in the urban area of Japan with trash removed.
- Sprayed amount 50mg per sprayed area
- Sprayed location 2 types
 Surface of mattress pad
 Inside of mattress pad (sprayed house dust on the surface of the filling material and covered it with cloth cover)
- Target allergen Allergen derived from the excrement of *Dermatophagoides farinae* Der f 1
 Allergen derived from the body of *Dermatophagoides farinae* Der f 2
- Suction speed 20cm/sec

Suction time	Equivalent to 1min/m ² (1.5 rounds of the sprayed area continuously) Equivalent to 3min/m ² (4 rounds of the sprayed area continuously)
Number of repetition	n=3

1-5. Testing method

Overview	We sprayed the designated amount of house dust (Figure 1-1) on the surface or inside (filling material surface) of the mattress pad, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using the test device. The house dust sprayed on the inside was suctioned from on top of the cloth cover. After this, we extracted the allergen from the area sprayed with house dust and used the ELISA method to measure the amount of allergen remaining within the sprayed area. For comparison, we conducted the same treatment except for the suctioning.
Allergen measurement	Sandwich ELISA We pre-coated solid-phase primary antibodies in each well of a 96-well microplate to capture the allergen. Next, we made secondary antibodies that have been labeled in advance react to the enzyme and substrate in order. We measured the absorbance of each color-producing well to calculate the allergen level of the sample from a standard curve.
Evaluation method	We indicated the results based on the remaining mite allergen amount (ng) per sprayed area. We used the formula shown below to calculate the remaining rate of allergen under each suction condition.

$$\text{Allergen remaining rate (\%)} = X/Y \times 100$$

X: Amount of remaining mite allergen (ng) on the object with suction

Y: Amount of remaining mite allergen (ng) on the object without suction

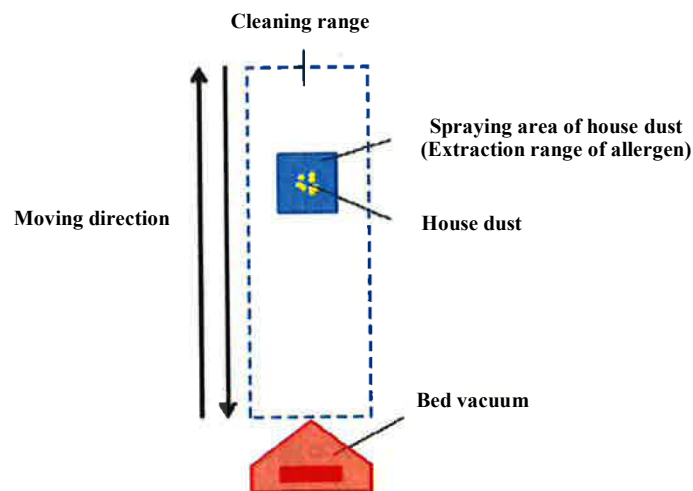


Figure 1-1. Schematic diagram of the test

1-6. Results

Table 1-1. Amount of remaining allergen (Der f 1) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	69.66	109.46	41.6	0.9
		2	106.08			
		3	152.64			
	Equivalent to 3min/m ² (4 rounds)	1	66.54	56.20	10.8	0.5
		2	57.12			
		3	44.94			
	No suction	1	11227.14	12030.24	695.6	-
		2	12440.13			
		3	12423.45			
Inside (filling material surface)	Equivalent to 1min/m ² (1.5 rounds)	1	8993.61	8690.53	631.0	69.6
		2	9112.83			
		3	7965.15			
	Equivalent to 3min/m ² (4 rounds)	1	7805.04	7296.30	519.7	58.5
		2	7317.66			
		3	6766.20			
	No suction	1	12168.72	12480.06	580.7	-
		2	12121.47			
		3	13149.99			

Table 1-2. Amount of remaining allergen (Der f 2) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	8.64	13.06	4.5	1.2
		2	12.90			
		3	17.64			
	Equivalent to 3min/m ² (4 rounds)	1	6.78	6.46	0.7	0.6
		2	6.96			
		3	5.64			
	No suction	1	1112.73	1101.63	26.6	-
		2	1071.30			
		3	1120.86			
Inside (filling material surface)	Equivalent to 1min/m ² (1.5 rounds)	1	563.82	578.79	14.3	76.6
		2	580.32			
		3	592.23			
	Equivalent to 3min/m ² (4 rounds)	1	513.36	532.66	18.4	70.5
		2	534.51			
		3	550.11			
	No suction	1	773.82	755.82	16.4	-
		2	741.78			
		3	751.86			

1-7. Summary

1) We sprayed the designated amount of house dust on the surface or inside (filling material surface) of the mattress pad, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using bed cleaner “Raycop RS2-100.” The house dust sprayed on the inside was suctioned from on top of the cloth cover. Then, we extracted the allergen from the area sprayed with house dust to consider the allergen remaining rate when suctioning with “Raycop RS2-100” in comparison with the remaining allergen amount on the object of comparison (no suction).

2-1) The mite allergen (Der f 1) remaining rate when suctioning the mattress pad sprayed with house dust on the surface using “Raycop RS2-100” was 0.9% for equivalent to 1min/m² and 0.5% for equivalent to 3min/m² (Table 1-1). In addition, when spraying house dust on the inside, the remaining rate was 69.6% for equivalent to 1min/m² and 58.5% for equivalent to 3min/m² (Table 1-1).

2-2) The mite allergen (Der f 2) remaining rate when suctioning the mattress pad sprayed with house dust on the surface using “Raycop RS2-100” was 1.2% for equivalent to 1min/m² and 0.6% for equivalent to 3min/m² (Table 1-2). In addition, when spraying house dust on the inside, the remaining rate was 76.6% for equivalent to 1min/m² and 70.5% for equivalent to 3min/m² (Table 1-2).

1-8. Supplementary information

The results of this test shall not be used for comparison with test results of different experiments or different testing conditions.

Test date: August 3 - August 7, 2015

Test 2

- 2-1. Test name** Consideration of allergen removing effects by suctioning with a bed cleaner
- 2-2. Purpose of test** The purpose of this test is to use bed cleaner “Raycop RS2-100” to suction house dust from a pseudo-contaminated bedding (bed cover) and then measure the amount of mite allergen remaining on the pseudo-contaminated bedding to consider the effects of suctioning by using “Raycop RS2-100” on removing mite allergen.

2-3. Subject

- Subject Raycop RS2-100
- Comparison No suction

2-4. Test condition

- Suction target Bedding that has been artificially contaminated with mite allergen
 Bed cover: Mash bed cover IVS x 4 (Tansu No Gen)
 Cloth cover 100% polyester
 Filling material 100% polyester
- Suction mode Bed cover mode
- Sprayed object House dust^{*1} (special order item, ITEA)
^{*1} This is a collection of dust gathered from the vacuum cleaner of multiple general households in the urban area of Japan with trash removed.
- Sprayed amount 80mg per sprayed area
- Sprayed location 2 types
 Bed cover surface
 Inside of bed cover (sprayed house dust on the surface of the filling material and covered it with cloth cover)
- Target allergen Allergen derived from the excrement of Dermatophagoides farinae Der f 1
 Allergen derived from the body of Dermatophagoides farinae Der f 2
- Suction speed 20cm/sec

Suction time	Equivalent to 1min/m ² (1.5 rounds of the sprayed area continuously) Equivalent to 3min/m ² (4 rounds of the sprayed area continuously)
Number of repetition	n=3

2-5. Testing method

Overview We sprayed the designated amount of house dust (Figure 2-1) on the surface or inside of the bed cover, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using the test device. The house dust sprayed on the inside was suctioned from on top of the cloth cover. After this, we extracted the allergen from the area sprayed with house dust and used the ELISA method to measure the amount of allergen remaining within the sprayed area. For comparison, we conducted the same treatment except for the suctioning.

Allergen measurement Sandwich ELISA

We pre-coated solid-phase primary antibodies in each well of a 96-well microplate to capture the allergen. Next, we made secondary antibodies that have been labeled in advance react to the enzyme and substrate in order. We measured the absorbance of each color-producing well to calculate the allergen level of the sample from a standard curve.

Evaluation method We indicated the results based on the remaining mite allergen amount (ng) per sprayed area. We used the formula shown below to calculate the remaining rate of allergen under each suction condition.

$$\text{Allergen remaining rate (\%)} = X/Y \times 100$$

X: Amount of remaining mite allergen (ng) on the object with suction

Y: Amount of remaining mite allergen (ng) on the object without suction

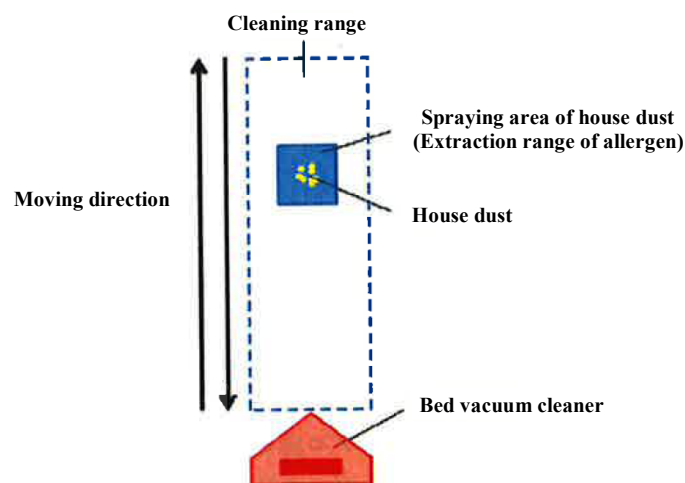


Figure 2-1. Schematic diagram of the test

2-6. Results

Table 2-1. Amount of remaining allergen (Der f 1) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	<14.04	-	-	<0.1
		2	<14.04			
		3	<14.04			
	Equivalent to 3min/m ² (4 rounds)	1	<14.04	-	-	<0.1
		2	<14.04			
		3	<14.04			
	No suction	1	12138.87	12645.18	612.3	-
		2	13325.64			
		3	12471.03			
Inside (filling material surface)	Equivalent to 1min/m ² (1.5 rounds)	1	9574.76	9759.24	207.6	81.6
		2	9984.04			
		3	9718.92			
	Equivalent to 3min/m ² (4 rounds)	1	7429.62	7219.15	305.5	60.4
		2	7359.10			
		3	6868.74			
	No suction	1	11890.53	11956.90	80.4	-
		2	12046.29			
		3	11933.88			

Table 2-2. Amount of remaining allergen (Der f 2) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	<4.68	-	-	<0.5
		2	<4.68			
		3	<4.68			
	Equivalent to 3min/m ² (4 rounds)	1	<4.68	-	-	<0.5
		2	<4.68			
		3	<4.68			
	No suction	1	963.06	977.26	13.0	-
		2	980.28			
		3	988.44			
Inside (filling material surface)	Equivalent to 1min/m ² (1.5 rounds)	1	346.85	348.16	18.8	92.7
		2	367.59			
		3	330.05			
	Equivalent to 3min/m ² (4 rounds)	1	266.94	286.91	19.5	76.4
		2	305.91			
		3	287.88			
	No suction	1	401.25	375.50	30.7	-
		2	383.66			
		3	341.60			

2-7. Summary

1) We sprayed the designated amount of house dust on the surface or inside (filling material surface) of the bed cover, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using bed cleaner “Raycop RS2-100.” The house dust sprayed on the inside was suctioned from on top of the cloth cover. Then, we extracted the allergen from the area sprayed with house dust to consider the allergen remaining rate when suctioning with “Raycop RS2-100” in comparison with the remaining allergen amount on the object of comparison (no suction).

2-1) The mite allergen (Der f 1) remaining rate when suctioning the bed cover sprayed with house dust on the surface using “Raycop RS2-100” was <0.1% for both equivalent to 1min/m² and equivalent to 3min/m² (Table 2-1). In addition, when spraying house dust on the inside, the remaining rate was 81.6% for equivalent to 1min/m² and 60.4% for equivalent to 3min/m² (Table 2-1).

2-2) The mite allergen (Der f 2) remaining rate when suctioning the bed cover sprayed with house dust on the surface using “Raycop RS2-100” was <0.5% for both equivalent to 1min/m² and equivalent to 3min/m² (Table 2-2). In addition, when spraying house dust on the inside, the remaining rate was 92.7% for equivalent to 1min/m² and 76.4% for equivalent to 3min/m² (Table 2-2).

2-8. Supplementary information

The results of this test shall not be used for comparison with test results of different experiments or different testing conditions.

Test date: August 17 - August 24, 2015

Test 3

3-1. Test name Consideration of allergen removing effects by suctioning with a bed cleaner

3-2. Purpose of test The purpose of this test is to use bed cleaner “Raycop RS2-100” to suction house dust from a pseudo-contaminated bedding (down quilt) and then measure the amount of mite allergen remaining on the pseudo-contaminated bedding to consider the effects of suctioning by using “Raycop RS2-100” on removing mite allergen.

3-3. Subject

Subject Raycop RS2-100

Comparison No suction

3-4. Test condition

Suction target Bedding that has been artificially contaminated with mite allergen
Down quilt: Feather Skin Comforter (Nishikawa Sangyo Co., Ltd.)

Stock number	AQS 0500004
Design number	MD5020
Color	A1
Cloth cover	85% polyester, 15% cotton
Filling material	70% down, 30% feather

Suction mode Down quilt mode

Sprayed object House dust^{*1} (special order item, ITEA)
^{*1} This is a collection of dust gathered from the vacuum cleaner of multiple general households in the urban area of Japan with trash removed.

Sprayed amount 10mg per sprayed area

Sprayed location Down quilt surface

Target allergen Allergen derived from the excrement of *Dermatophagoides farinae* Der f 1
Allergen derived from the body of *Dermatophagoides farinae* Der f 2

Suction speed 20cm/sec

Suction time	Equivalent to 1min/m ² (1.5 rounds of the sprayed area continuously) Equivalent to 3min/m ² (4 rounds of the sprayed area continuously)
Number of repetition	n=3

3-5. Testing method

Overview We sprayed the designated amount of house dust (Figure 3-1) on the surface of the down quilt, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using the test device. After this, we extracted the allergen from the area sprayed with house dust and used the ELISA method to measure the amount of allergen remaining within the sprayed area. For comparison, we conducted the same treatment except for the suctioning.

Allergen measurement Sandwich ELISA

We pre-coated solid-phase primary antibodies in each well of a 96-well microplate to capture the allergen. Next, we made secondary antibodies that have been labeled in advance react to the enzyme and substrate in order. We measured the absorbance of each color-producing well to calculate the allergen level of the sample from a standard curve.

Evaluation method We indicated the results based on the remaining mite allergen amount (ng) per sprayed area.

We used the formula shown below to calculate the remaining rate of allergen under each suction condition.

$$\text{Allergen remaining rate (\%)} = X/Y \times 100$$

X: Amount of remaining mite allergen (ng) on the object with suction

Y: Amount of remaining mite allergen (ng) on the object without suction

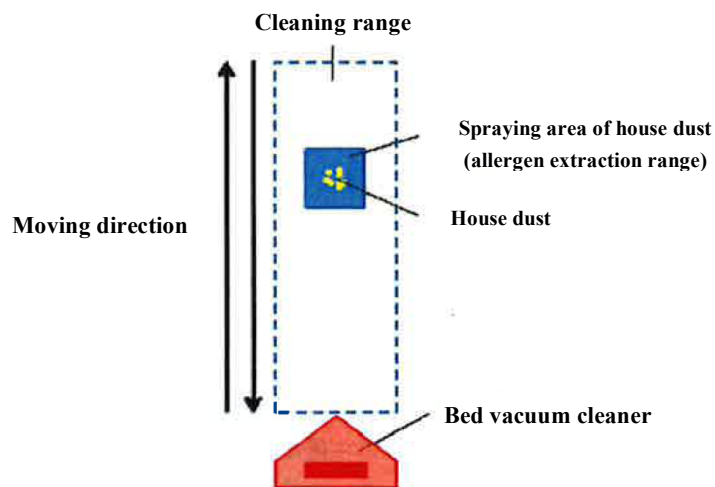


Figure 3-1. Schematic diagram of the test

3-6. Results

Table 3-1. Amount of remaining allergen (Der f 1) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	<14.04 ^{*1}	-	-	<0.1
		2	<14.04 ^{*1}			
		3	<14.04 ^{*1}			
	Equivalent to 3min/m ² (4 rounds)	1	<14.04 ^{*1}	-	-	<0.1
		2	<14.04 ^{*1}			
		3	<14.04 ^{*1}			
	No suction	1	14992.20	15497.49	684.9	-
		2	16276.95			
		3	15223.31			

^{*1} Detection limit 14.04ng

Table 3-2. Amount of remaining allergen (Der f 2) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	<4.68 ^{*1}	-	-	<0.6
		2	<4.68 ^{*1}			
		3	<4.68 ^{*1}			
	Equivalent to 3min/m ² (4 rounds)	1	<4.68 ^{*1}	-	-	<0.6
		2	<4.68 ^{*1}			
		3	<4.68 ^{*1}			
	No suction	1	759.53	776.43	71.3	-
		2	854.70			
		3	715.07			

^{*1} Detection limit 4.68ng

3-7. Summary

1) We sprayed the designated amount of house dust on the surface of the down quilt, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using bed cleaner “Raycop RS2-100.” Then, we extracted the allergen from the area sprayed with house dust to consider the allergen remaining rate when suctioning with “Raycop RS2-100” in comparison with the remaining allergen amount on the object of comparison (no suction).

2-1) The mite allergen (Der f 1) remaining rate when suctioning the down quilt using “Raycop RS2-100” was <0.1% for both equivalent to 1min/m² and equivalent to 3min/m² (Table 3-1).

2-2) The mite allergen (Der f 2) remaining rate when suctioning the down quilt using “Raycop RS2-100” was <0.6% for both equivalent to 1min/m² and equivalent to 3min/m² (Table 3-2).

3-8. Supplementary information The results of this test shall not be used for comparison with test results of different experiments or different testing conditions.

Test date: August 3 - August 11, 2015

Test 4

4-1. Test name Consideration of allergen removing effects by suctioning with a bed cleaner

4-2. Purpose of test The purpose of this test is to use bed cleaner “Raycop RS2-100” to suction house dust from a pseudo-contaminated bedding (blanket) and then measure the amount of mite allergen remaining on the pseudo-contaminated bedding to consider the effects of suctioning by using “Raycop RS2-100” on removing mite allergen.

4-3. Subject

Subject Raycop RS2-100

Comparison No suction

4-4. Test condition

Suction target Bedding that has been artificially contaminated with mite allergen

Blanket: Microfiber Blanket Plain Single

(Clearglobe Co., Ltd.)

Stock number CGMFB14190

Color Ivory (IV)

Composition 100% polyester

Suction mode Down quilt mode

Sprayed object House dust^{*1} (special order item, ITEA)

^{*1} This is a collection of dust gathered from the vacuum cleaner of multiple general households in the urban area of Japan with trash removed.

Sprayed amount 35mg per sprayed area

Sprayed location Blanket surface

Target allergen Allergen derived from the excrement of *Dermatophagoides farinae* Der f 1

Allergen derived from the body of *Dermatophagoides farinae* Der f 2

Suction speed 20cm/sec

Suction time Equivalent to 1min/m² (1.5 rounds of the sprayed area continuously)
 Equivalent to 3min/m² (4 rounds of the sprayed area continuously)

Number of repetition n=3

4-5. Testing method

Overview We sprayed the designated amount of house dust (Figure 4-1) on the surface of the blanket, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using the test device. After this, we extracted the allergen from the area sprayed with house dust and used the ELISA method to measure the amount of allergen remaining within the sprayed area. For comparison, we conducted the same treatment except for the suctioning.

Allergen measurement Sandwich ELISA

We pre-coated solid-phase primary antibodies in each well of a 96-well microplate to capture the allergen. Next, we made secondary antibodies that have been labeled in advance react to the enzyme and substrate in order. We measured the absorbance of each color-producing well to calculate the allergen level of the sample from a standard curve.

Evaluation method We indicated the results based on the remaining mite allergen amount (ng) per sprayed area.

We used the formula shown below to calculate the remaining rate of allergen under each suction condition.

$$\text{Allergen remaining rate (\%)} = X/Y \times 100$$

X: Amount of remaining mite allergen (ng) on the object with suction

Y: Amount of remaining mite allergen (ng) on the object without suction

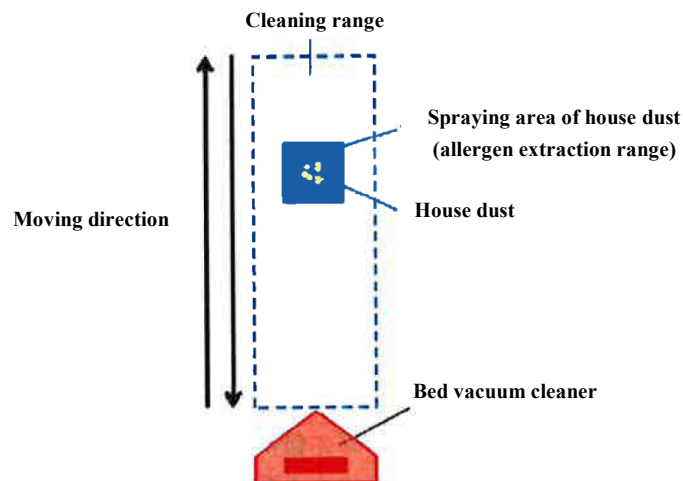


Figure 4-1. Schematic diagram of the test

4-6. Results

Table 4-1. Amount of remaining allergen (Der f 1) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	2875.05	2920.60	287.6	22.4
		2	3228.27			
		3	2658.48			
	Equivalent to 3min/m ² (4 rounds)	1	1963.44	2116.15	289.4	16.3
		2	1935.11			
		3	2449.91			
	No suction	1	12833.25	13021.00	174.7	-
		2	13178.66			
		3	13051.08			

Table 4-2. Amount of remaining allergen (Der f 2) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	104.52	102.06	7.5	13.5
		2	108.06			
		3	93.60			
	Equivalent to 3min/m ² (4 rounds)	1	59.07	68.39	8.3	9.0
		2	71.01			
		3	75.09			
	No suction	1	724.43	758.31	31.4	-
		2	786.45			
		3	764.04			

4-7. Summary

1) We sprayed the designated amount of house dust on the surface of the blanket, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using bed cleaner “Raycop RS2-100.” Then, we extracted the allergen from the area sprayed with house dust to consider the allergen remaining rate when suctioning with “Raycop RS2-100” in comparison with the remaining allergen amount on the object of comparison (no suction).

2-1) The mite allergen (Der f 1) remaining rate when suctioning the blanket using “Raycop RS2-100” was 22.4% for equivalent to 1min/m² and 16.3% for equivalent to 3min/m² (Table 4-1).

2-2) The mite allergen (Der f 2) remaining rate when suctioning the blanket using “Raycop RS2-100” was 13.5% for equivalent to 1min/m² and 9.0% for equivalent to 3min/m² (Table 4-2).

4-8. Supplementary information The results of this test shall not be used for comparison with test results of different experiments or different testing conditions.

Test date: August 3 - August 11, 2015

Test 5

5-1. Test name	Consideration of allergen removing effects by suctioning with a bed cleaner
5-2. Purpose of test	The purpose of this test is to use bed cleaner “Raycop RS2-100” to suction house dust from a pseudo-contaminated bedding (cotton blanket) and then measure the amount of mite allergen remaining on the pseudo-contaminated bedding to consider the effects of suctioning by using “Raycop RS2-100” on removing mite allergen.
5-3. Subject	
Subject	Raycop RS2-100
Comparison	No suction
5-4. Test condition	
Suction target	Bedding that has been artificially contaminated with mite allergen (hereinafter “bedding”) Cotton blanket: Cotton Blanket (Nishikawa Living Inc.) Stock number 2032-41377 Design number TK-413 Color 10 (Pink) Composition 100% cotton
Suction mode	Bed cover mode
Sprayed object	House dust ^{*1} (special order item, ITEA) ^{*1} This is a collection of dust gathered from the vacuum cleaner of multiple general households in the urban area of Japan with trash removed.
Sprayed amount	25mg per sprayed area
Sprayed location	Cotton blanket surface
Target allergen	Allergen derived from the excrements of Dermatophagoides farinae Der f 1 Allergen derived from the body of Dermatophagoides farinae Der f 2
Suction speed	20cm/sec

Suction time	Equivalent to 1min/m ² (1.5 rounds of the sprayed area continuously) Equivalent to 3min/m ² (4 rounds of the sprayed area continuously)
Number of repetition	n=3

5-5. Testing method

Overview We sprayed the designated amount of house dust (Figure 5-1) on the surface of the cotton blanket, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using the test device. After this, we extracted the allergen from the area sprayed with house dust and used the ELISA method to measure the amount of allergen remaining within the sprayed area. For comparison, we conducted the same treatment except for the suctioning.

Allergen measurement Sandwich ELISA
We pre-coated solid-phase primary antibodies in each well of a 96-well microplate to capture the allergen. Next, we made secondary antibodies that have been labeled in advance react to the enzyme and substrate in order. We measured the absorbance of each color-producing well to calculate the allergen level of the sample from a standard curve.

Evaluation method We indicated the results based on the remaining mite allergen amount (ng) per sprayed area.
We used the formula shown below to calculate the remaining rate of allergen under each suction condition.

$$\text{Allergen remaining rate (\%)} = X/Y \times 100$$

X: Amount of remaining mite allergen (ng) on the object with suction
Y: Amount of remaining mite allergen (ng) on the object without suction

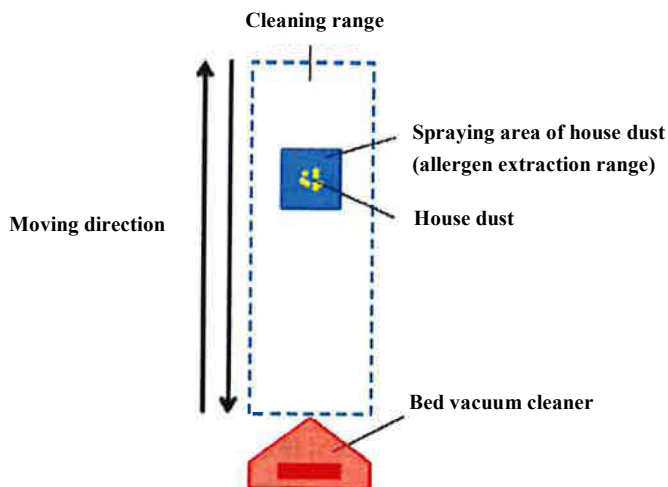


Figure 5-1. Schematic diagram of the test

Reports without a company seal or seal of persons conducting the measurement, as well as copied reports, shall not be deemed as an official report. Approval of ITEA Inc. must be obtained before reprinting or quoting this report elsewhere. The test results are values pertaining to the specimen submitted to the Institute of Tokyo Environmental Allergy, and they do not indicate the values of the entire manufacturing lot or product.
©ITEA Inc. 2015

5-6. Results

Table 5-1. Amount of remaining allergen (Der f 1) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	689.31	583.54	121.3	4.2
		2	610.11			
		3	451.20			
	Equivalent to 3min/m ² (4 rounds)	1	350.28	257.24	97.6	1.9
		2	265.83			
		3	155.60			
	No suction	1	13709.18	13847.14	182.6	-
		2	14054.19			
		3	13778.06			

Table 5-2. Amount of remaining allergen (Der f 2) per sprayed area and allergen remaining rate

Sprayed part	Test classification	n	Remaining allergen amount (ng)	Avg. value (ng)	Standard deviation	Allergen remaining rate (%)
Surface	Equivalent to 1min/m ² (1.5 rounds)	1	<4.68 ^{*1}	-	-	<5.3
		2	<4.68 ^{*1}			
		3	<4.68 ^{*1}			
	Equivalent to 3min/m ² (4 rounds)	1	<4.68 ^{*1}	-	-	<5.3
		2	<4.68 ^{*1}			
		3	<4.68 ^{*1}			
	No suction	1	80.01	87.57	10.5	-
		2	99.60			
		3	83.10			

*1 Detection limit 4.68ng

5-7. Summary

1) We sprayed the designated amount of house dust on the surface of the cotton blanket, and we suctioned the said sprayed area the designated number of times at a speed of 20cm/sec using bed cleaner “Raycop RS2-100.” Then, we extracted the allergen from the area sprayed with house dust to consider the allergen remaining rate when suctioning with “Raycop RS2-100” in comparison with the remaining allergen amount on the object of comparison (no suction).

2-1) The mite allergen (Der f 1) remaining rate when suctioning the cotton blanket using “Raycop RS2-100” was 4.2% for equivalent to 1min/m² and 1.9% for equivalent to 3min/m² (Table 5-1).

2-2) The mite allergen (Der f 2) remaining rate when suctioning the cotton blanket using “Raycop RS2-100” was <5.3% for both equivalent to 1min/m² and equivalent to 3min/m² (Table 5-2).

5-8. Supplementary information The results of this test shall not be used for comparison with test results of different experiments or different testing conditions.

Test date: August 3 - August 11, 2015

ITEA Inc.

Institute of Tokyo Environmental Allergy

Seidomae Bldg. 1-2-5 Yushima, Bunkyo-ku, Tokyo

Phone: 03-3526-2031 Fax: 03-3526-2032



Test by: Kayo Okawa



Yuka Fujii

