

Group Quality Certification System of Air Cleaners for Air Conditioners (CAC Mark)



 **KOREA AIR CLEANING ASSOCIATION**

1. Overview

■ What is the group quality certification system of air cleaners for air conditioners (CAC mark)?



The mark is granted to products which pass through tests by certified test agencies based on group standards on air cleaners for air conditioners established by the CAC on major functions including the deodorizing efficiency and ozone production concentration to provide reliable air cleaners for air conditioners to customers. Consumers may purchase the products with the CAC mark with satisfaction.

■ Procedure for certifying the CAC mark



[Figure 1] Procedure for certifying the CAC mark

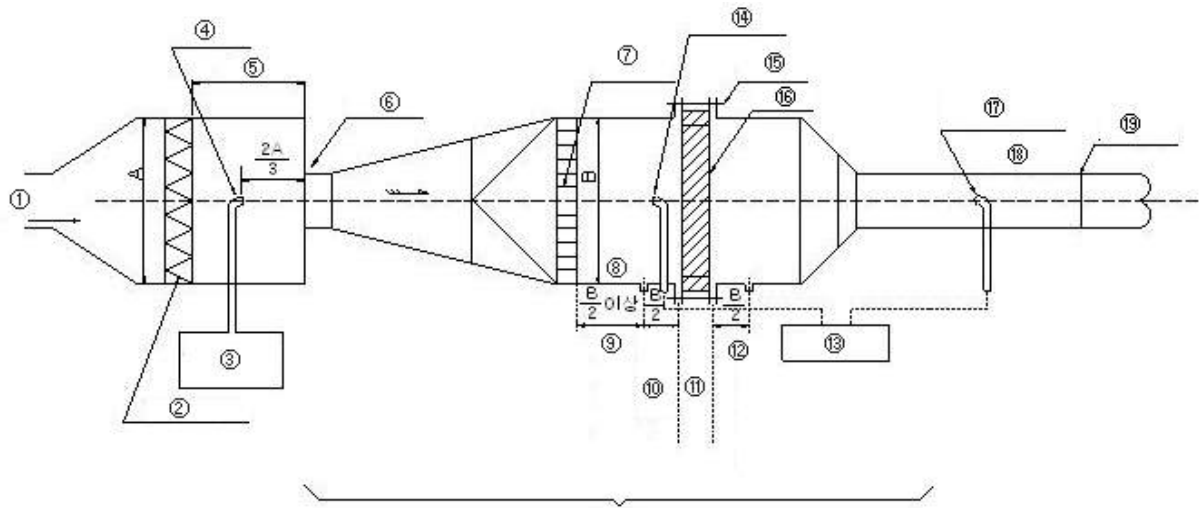
1. Apply for and receive the CAC certification test (company > association)
2. Receive and check the application form and perform site inspection on selecting prototypes (association > company)
3. Request the performance evaluation test to designated (national research institute) test agencies (association > test agency)
4. Notify the performance evaluation test (test agency > association)
5. Open the review board on granting the CAC certification mark
6. Issue the CAC report from the Korea Air Cleaning Association (association > company)
7. Apply for issuing the CAC certificate and its certified notification (company > association)
8. Issue the CAC certification and certified document and manage follow-up

2. Test method and certification standard

■ How to test the air cleaner for the air conditioner

The performance test of the air cleaner for the air conditioner is performed in a place with the temperature of $23\pm 5^{\circ}\text{C}$ and the atmospheric pressure of $760\pm 20\text{mmHg}$ with no wind in case of no specific conditions.

- The airflow test performed in accordance with the schedule 1 of the KS C 9304 by operating the air cleaner with rating frequency and voltage.
- Removing fine dusts (cleaning) test is done by installing the test body on the test duct, flowing the rating airflow, checking the stabilization of particle concentration and alternatively checking the particle concentrations on the inlet and the outlet to calculate the removal ratio based on the formula.

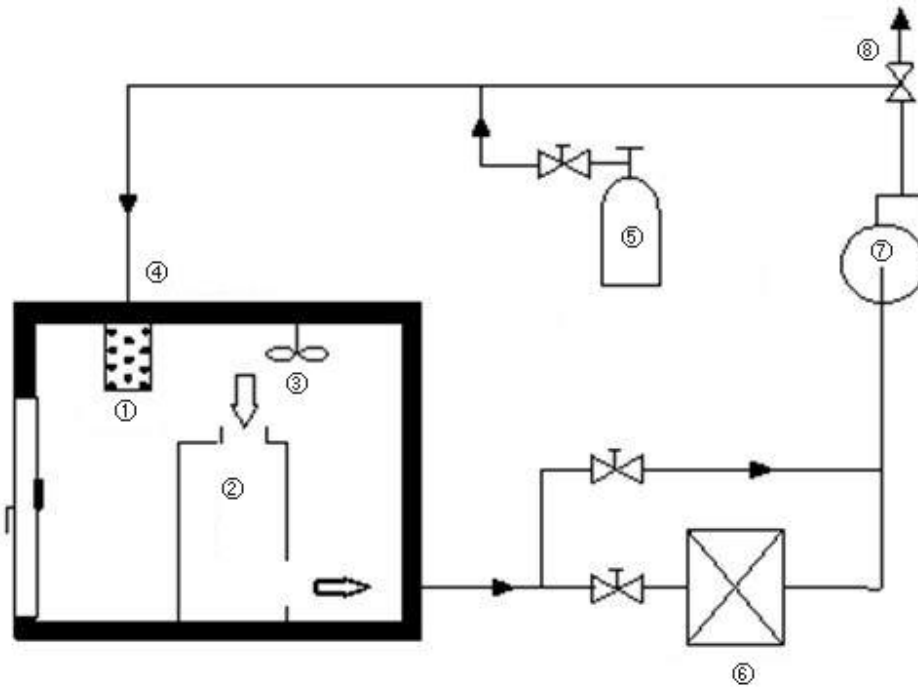


- ①From ventilator ②cleaning filter ③test particle generator
- ④infuse pipe for test particles ⑤more than A ⑥bell mouse ⑦rectifying grid
- ⑧more than B/2 ⑨place measuring static pressure
- ⑩measurement range of upstream concentration ⑪test particle fixture
- ⑫place measuring static pressure ⑬particle counter ⑭pipe for taking upstream test particles
- ⑮gasket ⑯test material ⑰pipe for taking downstream test particles
- ⑱flow measurement ⑲orifice

[Fig. 2] Schematic View of Duct for Testing Fine Dust Removal Rate

- Removing hazardous gas (deodorizing efficiency) test is performed under the air environment below.

a) Temperature: $23 \pm 5^\circ\text{C}$, b) Relative humidity: $55 \pm 15\%$, c) Dust and gas concentration: Below the indoor environment standard in the public sanitation act The gases under the test include: a) ammonia (NH_3), b) acetaldehyde (CH_3CHO) and c) acetate (CH_3COOH)



- ①Diffuser ②test material ③agitator fan ④enclosed chamber ⑤gas generator
 ⑥activated carbon filter ⑦ventilator ⑧exhaust

[Fig. 3] Configuring Test Chamber for Toxic Gas Removal Test and Gas Supply Line

- The ozone production test is performed before the test removing fine dusts and hazardous gases from the test body. The test is performed under the air environment condition below.

a) Temperature: $23 \pm 5^\circ\text{C}$, b) Relative humidity: $55 \pm 15\%$, c) Dust and gas concentration: Below the indoor environment standard in the public sanitation act The chamber and the test room shall be measured in the chamber for removal test or an indoor space with the volume of $(29.5 \pm 1)\text{m}^3$ (lower than 3m of the ceiling). The test body shall be installed in the center of the test room and be placed about 75cm above the floor for measurement on the table.

■ **Item and standard for certification**

- The range of applying the CAC certification mark

| Test and certification item | Benchmark | Remarks |
|--|---------------------|---------|
| Rating airflow (applied area) | Display performance | |
| Cleaning performance (removing fine dusts) | Display performance | |
| Rates of removing hazardous gases (Deodorizing efficiency) | Higher than 50% | |
| Benchmark for ozone production (ppm) | Less than 0.05ppm | |

[Table 1] Certification items and benchmark for the CAC certification mark

- The rating airflow (applied area) and the cleaning performance show the performance test result.
- It shall have higher than 50% of the deodorizing efficiency (removing hazardous gases) and remove more than 0.5 liter per 1m³/min.
- The ozone production benchmark shall have less than 0.05ppm of the maximum value of the ozone production concentration.

3. List of review board

■ Review board for the CAC certification mark

| No | Name | Title | Company Name | Position | Remarks |
|----|----------------------|--------------------------|--|---|---------|
| 1 | Yoonshin Kim | Professor | Hanyang University (head of the board) | Industrial medical school | |
| 2 | Woongi Lee | HQ Director | Korea Testing & Research Institute | Customer Service HQ | |
| 3 | Dongwon Yoon | Professor | Kyungwon University | Department of Construction Facilities | |
| 4 | Myungwoon Kim | Professor | Daejin University | Department of Environment Engineering | |
| 5 | Taesung Kim | Professor | Sungkyunkwan University | Department of Mechanical Engineering | |
| 6 | Kyunghoon Yoo | Chief researcher | Korea Institute of Industrial Technology | Convergent Technology R&D Division 연구부 | |
| 7 | Jungho Hwang | Professor | Yonsei University | Department of Mechanical Engineering | |
| 8 | Eunyoung Lee | Vice Manager of Planning | Consumers Korea | | |
| 9 | Sunghwan Kim | Professor | Dankuk University | Department of Microbiology | |
| 10 | Hyunjoon Moon | Professor | Dankuk University | Department of Architecture | |
| 11 | Myungdo Oh | Professor | University of Seoul | Department of Mechanical and Information Engineering Head of the Office of Planning and Research | |

4. Status of Certified Test Organizations

■ Status of certified test organizations as of 2013

(Period of consignment: January 1, 2013 -
December 31, 2014)

| No | Organization | Remarks |
|----|--|---------|
| 1 | Korea Conformity Laboratories | |
| 2 | Korea Institute of Machinery & Materials | |
| 3 | Center for Mechanical Parts and Material Technology Support in the Busan Techno Park | |

5. Certification status

■ Status of CAC mark certification

- Status of CAC certification products and companies (as of March 31, 2013)
- o Total: 6 models of 2 companies