



# 시험성적서



1. 성적서 번호 : CT19-040703

2. 의뢰자

○ 업체명 : 주식회사 현대엘앤씨

○ 주소 : 서울특별시 중구 을지로5길 26, 7, 8층 (수하동, 미래에셋 CENTER 1)

3. 시험기간 : 2019년 04월 01일 ~ 2019년 05월 02일

4. 시험성적서의 용도 : 품질관리

5. 시료명 : 칸스톤

6. 시험방법

(1) KS | ISO 16000-9:2014

7. 시험결과

1) 칸스톤

| 시험항목                      | 단위                     | 시험방법 | 시험결과                  | 비고 |
|---------------------------|------------------------|------|-----------------------|----|
| 총휘발성유기화합물 (TVOC)          | mg/(m <sup>3</sup> ·h) | (1)  | 0.013                 | -  |
| 벤젠 (Benzene)              | mg/(m <sup>3</sup> ·h) | (1)  | 불검출<br>(검출한계 0.000 5) | -  |
| 톨루엔 (Toluene)             | mg/(m <sup>3</sup> ·h) | (1)  | 0.001                 | -  |
| 에틸벤젠 (Ethylbenzene)       | mg/(m <sup>3</sup> ·h) | (1)  | 0.001                 | -  |
| 자일렌 (Xylen)               | mg/(m <sup>3</sup> ·h) | (1)  | 0.001                 | -  |
| 스타이렌 (Styrene)            | mg/(m <sup>3</sup> ·h) | (1)  | 0.003                 | -  |
| 포름알데하이드 (Formaldehyde)    | mg/(m <sup>3</sup> ·h) | (1)  | 0.001                 | -  |
| √ 아세트알데하이드 (Acetaldehyde) | mg/(m <sup>3</sup> ·h) | (1)  | 0.002                 | -  |

"√" 표시항목은 당 시험연구원의 KOLAS 인정범위 밖의 항목입니다.

|                                                                                                                                                                                                                         |             |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|
| 확인                                                                                                                                                                                                                      | 작성자명<br>김현진 | 기술책임자명<br>이준규 |
| 비교 : 1. 이 성적서는 의뢰자가 제시한 시료 및 시료명에 한정된 결과로서 전체제품에 대한 품질을 보증하지는 않습니다.<br>2. 이 성적서는 홍보, 선전, 광고 및 소송용으로 사용될 수 없으며, 용도 이외의 사용을 금합니다.<br>3. 이 성적서의 진위여부는 홈페이지( <a href="http://www.kcl.re.kr">www.kcl.re.kr</a> )에서 확인 가능합니다. |             |               |

위 성적서는 국제시험기관인정협력체 (International Laboratory Accreditation Cooperation) 상호인정협정 (Mutual Recognition Arrangement)에 서명한 한국인정기구 (KOLAS)로부터 공인받은 분야에 대한 시험결과입니다.

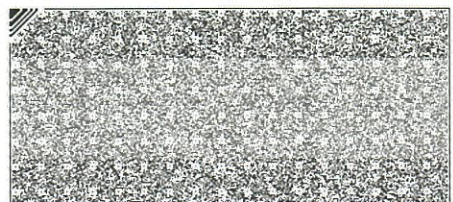
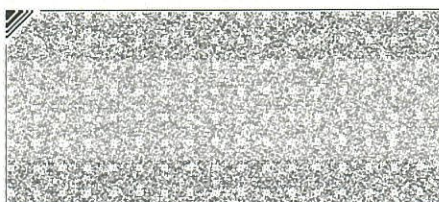
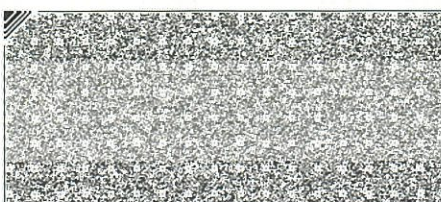
2019년 05월 02일

한국인정기구 인정 한국건설생활환경시험연구원



군포시험실 : 15845 경기도 군포시 공단로 149 1' VALLEY군포 805호 (031)389-9150

결과문의 : 건축유해성센터 ☎ (031)389-9107



# 시험성적서

성적서번호 : CT19-040703



## 첨부자료

### \* 시험조건

#### 1. 소형챔버 시험조건

|      |                   |       |                                    |
|------|-------------------|-------|------------------------------------|
| 시료형태 | 고체 건축자재           | 시료구분  | 일반자재                               |
| 온도   | 24.4 °C ~ 25.3 °C | 시료부하율 | 2.0 m <sup>2</sup> /m <sup>3</sup> |
| 상대습도 | 47 % ~ 50 %       | 환기횟수  | 0.50 회/h                           |

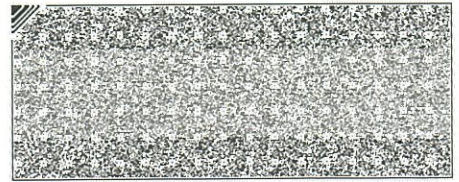
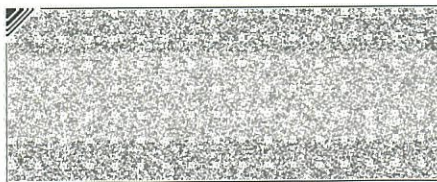
\* 시험기간 (챔버) : 7일

#### 2. 총휘발성유기화합물 (TVOC) 및 VOCs 분석조건

| ATD                  | Temperature (°C)    | Tube                                     | Trap               | Valve  | Transfer line |
|----------------------|---------------------|------------------------------------------|--------------------|--------|---------------|
|                      |                     | 295                                      | -30 ~ 300, 40 °C/s | 200    | 200           |
|                      | Timing (min)        | Sample                                   | Trap hold          | Desorb | Purge         |
|                      |                     | 7                                        | 15                 | 8      | 2             |
|                      | Split ratio         | 10 : 1                                   |                    |        |               |
| Detector             |                     | MS                                       |                    |        |               |
| Column               |                     | DB-1, Column ID : 0.32 mm, Length : 60 m |                    |        |               |
| Carrier gas and flow |                     | He, 2.5 mL/min                           |                    |        |               |
| Temperature program  | Initial temperature | 40 °C (5 min)                            |                    |        |               |
|                      | Temperature program | 6 °C/min                                 |                    |        |               |
|                      | Final temperature   | 280 °C (10 min)                          |                    |        |               |
| MS condition         | Mode                | EI (Electron ionization)                 |                    |        |               |
|                      | Electron energy     | 70 eV                                    |                    |        |               |
|                      | Detection mode      | TIC (Scan), m/z : 35 ~ 350               |                    |        |               |

#### 3. 알데하이드 (Aldehyde) 분석조건

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| Detector           | UV/Vis 360 nm                                         |
| Column             | C <sub>18</sub> , Column ID : 2.1 mm, Length : 100 mm |
| Mobile phase       | Acetonitrile/Water (40/60 v/v → 100/0 v/v (10 min))   |
| Analysis time      | 15 min                                                |
| Injection volume   | 5 µL                                                  |
| Column temperature | 40 °C                                                 |
| Flow rate          | 0.5 mL/min                                            |

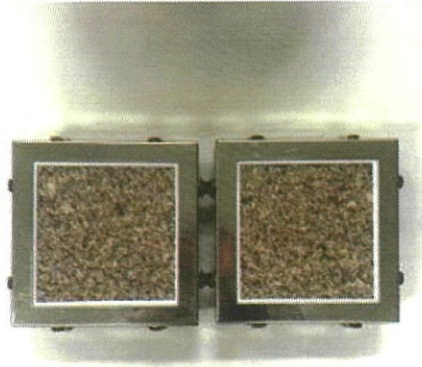


성적서번호 : CT19-040703

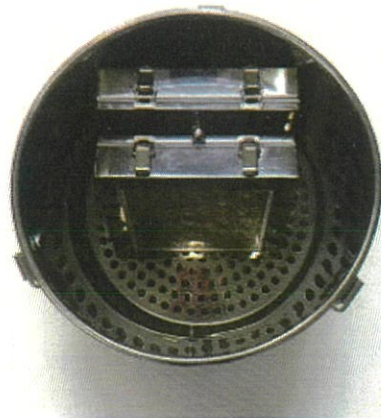
# 시험성적서



첨부자료



<챔버 설치전 사진>

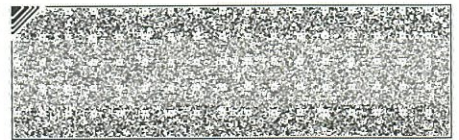
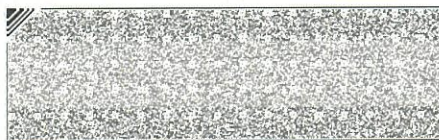


<챔버 설치후 사진>

---- 이 하 여 백 ----

총 3페이지 중 3페이지

양식QP-20-01-02(6)





# TEST REPORT



1. NO : CT19-040703

2. Client

○ Name : HYUNDAI L&C

○ Address : 26, Eulji-ro 5-gil, Jung-gu, Seoul, 04539 Republic of KOREA

3. Date of Test : 2019.04.01 ~ 2019.05.02

4. Use of Report : Quality Control

5. Test Sample : Hanstone

6. Test Method

(1) KS I ISO 16000-9:2014

7. Test Results

1) Hanstone

| Test Item(s)                            | Unit                    | Test Method | Test Results         | Remark |
|-----------------------------------------|-------------------------|-------------|----------------------|--------|
| Total Volatile Organic Compounds (TVOC) | mg/(m <sup>3</sup> · h) | (1)         | 0.013                | -      |
| Benzene                                 | mg/(m <sup>3</sup> · h) | (1)         | N/D<br>(MDL 0.000 5) | -      |
| Toluene                                 | mg/(m <sup>3</sup> · h) | (1)         | 0.001                | -      |
| Ethylbenzene                            | mg/(m <sup>3</sup> · h) | (1)         | 0.001                | -      |
| Xylene                                  | mg/(m <sup>3</sup> · h) | (1)         | 0.001                | -      |
| Styrene                                 | mg/(m <sup>3</sup> · h) | (1)         | 0.003                | -      |
| Formaldehyde                            | mg/(m <sup>3</sup> · h) | (1)         | 0.001                | -      |
| √ Acetaldehyde                          | mg/(m <sup>3</sup> · h) | (1)         | 0.002                | -      |

The test method marked with "√" is not accredited by KOLAS.

|             |                                   |                                          |
|-------------|-----------------------------------|------------------------------------------|
| Affirmation | Tested By<br>Name : Kim, Hyun Jin | Technical Manager<br>Name : Lee, Jun Gyu |
|-------------|-----------------------------------|------------------------------------------|

*Kim Hyun Jin*

*Lee Jun Gyu*

Our report apply only to the standards or procedures identified and to the sample(s) tested unless otherwise specified. The test results are not indicative of representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products. The authenticity of this test report can be checked on KCL website(www.kcl.re.kr).

The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2019.05.02

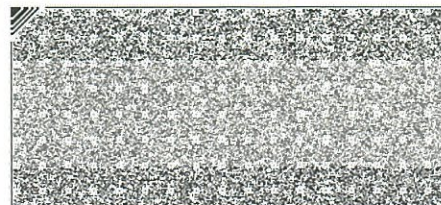
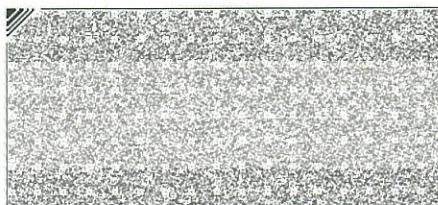
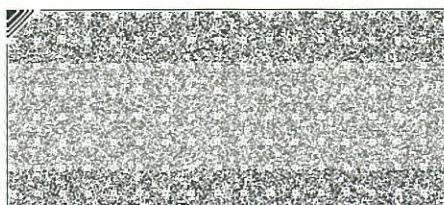
Korea Conformity Laboratories President Yoon, Kap Seok

*Yoon, Kap Seok*

Accredited by KOLAS, Republic of KOREA

Address : 15845 #805, 1' VALLEY Gunpo, 149, Gongdan-ro, Gunpo-si, Gyeonggi-do, 15845, Korea 82-31-389-9100

Result Inquiry : IAQ Center 82-31-389-9107



# TEST REPORT



No : CT19-040703

Attach

\* Condition of testing

1. Condition of emission test chamber

|             |                   |                   |                                    |
|-------------|-------------------|-------------------|------------------------------------|
| sample type | solid product     | sample            | panel                              |
| temperature | 24.4 °C ~ 25.3 °C | loading factor    | 2.0 m <sup>2</sup> /m <sup>3</sup> |
| humidity    | 47 % ~ 50 %       | air exchange rate | 0.50 h <sup>-1</sup>               |

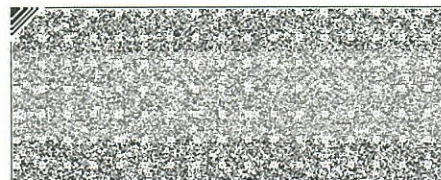
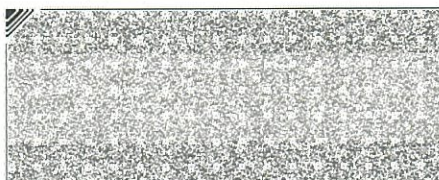
\* Period in Chamber : 7 days

2. Analysis condition of TVOC & VOCs

|                     |                      |                                          |                    |        |               |
|---------------------|----------------------|------------------------------------------|--------------------|--------|---------------|
| ATD                 | Temperature (°C)     | Tube                                     | Trap               | Valve  | Transfer line |
|                     |                      | 295                                      | -30 ~ 300, 40 °C/s | 200    | 200           |
|                     | Timing (min)         | Sample                                   | Trap hold          | Desorb | Purge         |
|                     |                      | 7                                        | 15                 | 8      | 2             |
|                     | Split ratio          | 10 : 1                                   |                    |        |               |
|                     | Detector             | MS                                       |                    |        |               |
|                     | Column               | DB-1, Column ID : 0.32 mm, Length : 60 m |                    |        |               |
|                     | Carrier gas and flow | He, 2.5 mL/min                           |                    |        |               |
| Temperature program | Initial temperature  | 40 °C (5 min)                            |                    |        |               |
|                     | Temperature program  | 6 °C/min                                 |                    |        |               |
|                     | Final temperature    | 280 °C (10 min)                          |                    |        |               |
| MS condition        | Mode                 | EI (Electron ionization)                 |                    |        |               |
|                     | Electron energy      | 70 eV                                    |                    |        |               |
|                     | Detection mode       | TIC (Scan), m/z : 35 ~ 350               |                    |        |               |

3. Analysis condition of aldehyde

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| Detector           | UV/Vis 360 nm                                         |
| Column             | C <sub>18</sub> , Column ID : 2.1 mm, Length : 100 mm |
| Mobile phase       | Acetonitrile/Water (40/60 v/v → 100/0 v/v (10 min))   |
| Analysis time      | 15 min                                                |
| Injection volume   | 5 µL                                                  |
| Column temperature | 40 °C                                                 |
| Flow rate          | 0.5 mL/min                                            |



# TEST REPORT

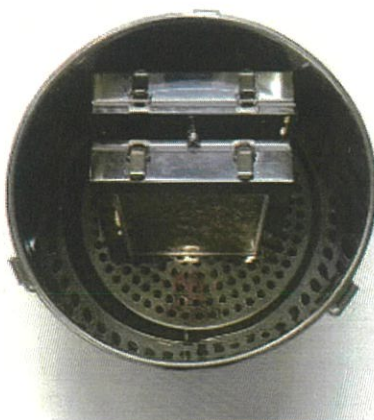


No : CT19-040703

Attach



< Picture #1 >



<Picture #2>

