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VOC EMISSION TEST REPORT

Indoor Air Comfort GOLD

13 October 2023

1 Sample Information

| | |
|------------------------|--------------|
| Sample name | The Wall |
| Batch no. | FA010609-001 |
| Stated production date | 22/08/2023 |
| Product type | Panel |
| Sample reception | 01/09/2023 |

2 Brief Evaluation of the Results

| Regulation or protocol | Conclusion | Version of regulation or protocol |
|-------------------------------|---|--|
| French VOC Regulation |  | Decree of March 2011 (DEVL1101903D) and Arrêté of April 2011 (DEVL1104875A) modified in February 2012 (DEVL1133129A) |
| French CMR components | Pass | Regulation of April and May 2009 (DEVP0908633A and DEVP0910046A) |
| Italian CAM Edilizia | Pass | DM 23 giugno 2022 n. 256, GURI n. 183 del 6 agosto 2022 |
| ABG/AgBB | Pass | Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (June 2021) |
| Belgian Regulation | Pass | Royal decree of May 2014 (C-2014/24239) |
| EMICODE | EC 1 PLUS | September 2022 |
| Indoor Air Comfort | Pass | Indoor Air Comfort 9.0 of June 2023 |
| Indoor Air Comfort GOLD | Pass | Indoor Air Comfort GOLD 9.0 of June 2023 |
| BREEAM International | Exemplary Level | BREEAM International New Construction v6.0 (2021) |
| BREEAM NOR | Exemplary Level | BREEAM-NOR v6.0 New Construction (2022) |
| EU Taxonomy | Pass | Regulation (EU) 2020/852 of the European Parliament and of the Council |
| LEED v4.1 BETA (outside U.S.) | Pass | LEED v4.1 BETA for Building Design and Construction (February 2021) |

Full details based on the testing and direct comparison with limit values are available in the following pages
Regarding pass/fail decision rule please see appendix


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3 Applied Test Methods

3.1 General Test References

| Regulation, protocol or standard | Version | Reporting limit VOC [$\mu\text{g}/\text{m}^3$] | Calculation of TVOC | Combined uncertainty ^a [RSD(%)] |
|--|---|--|---------------------|--|
| EN 16516 | 2017 + A1:2020 | 5 | Toluene equivalents | 22% |
| ISO 16000 -3 -6 -9 -11 | 2006-2022 depending on part | 2 | Toluene equivalents | 22% |
| ASTM D5116-10 | 2010 | - | - | - |
| Specifications Indoor Air Comfort Gold | 9.0 of June 2023 | 5 | Toluene equivalents | 22% |
| French VOC Classes | Decree of 03/2011 (DEVL1101903D) and arrêté of 02/2012 (DEVL1133129A) | 2 | Toluene equivalents | 22% |
| French CMR | Regulation of April and May 2009 (DEVP0908633A and DEVP0910046A) | 1 | Toluene equivalents | 22% |
| Italian CAM Edilizia | Decree 6 August 2022 | 2 | Toluene equivalents | 22% |
| AgBB (MVV TB/ABG) | June 2021 (2023/2022) | 5 | Compound Specific | 22% |
| Belgian VOC | Royal decree of May 2014 (C - 2014 / 24239) | 5 | Toluene equivalents | 22% |
| EMICODE | September 2022 | 5 | Toluene equivalents | 22% |
| BREEAM NOR | BREEAM-NOR v6.0 New Construction (2022) | 5 | Toluene equivalents | 22% |
| BREEAM International | BREEAM International New Construction v6.0 (2021) | 5 | Toluene equivalents | 22% |
| LEED v4.1 BETA (outside U.S.) | February 2021 | 5 | Compound Specific | 22% |
| EU Taxonomy | Regulation (EU) 2020/852; Annex 1/2 section 7.1 and 7.2 | - | - | 22% |

3.2 Specific Laboratory Sampling and Analyses

| Procedure | External Method | Internal SOP | Quantification limit / sampling volume | Analytical principle | Uncertainty ^a [RSD(%)] |
|--------------------------|---|--------------|--|-------------------------|-----------------------------------|
| Sample preparation | ISO 16000-11:2006, EN 16516:2017+A1:2020, AgBB:2021, EMICODE:2022 | 71M549810 | - | - | - |
| Emission chamber testing | ISO 16000-9:2006, EN 16516:2017+A1:2020 | 71M549811 | - | Chamber and air control | - |
| Sampling of VOC | ISO 16000-6:2021, EN 16516:2017+A1:2020 | 71M549812 | 5 L | Tenax TA | - |
| Analysis of VOC | ISO 16000-6:2021, EN 16516:2017+A1:2020 | 71M542808B | 1 $\mu\text{g}/\text{m}^3$ | ATD-GC/MS | 10% |
| Sampling of aldehydes | ISO 16000-3:2022, EN 16516:2017+A1:2020 | 71M549812 | 35 L | DNPH | - |
| Analysis of aldehydes | ISO 16000-3:2022, EN 16516:2017+A1:2020 | 71M548400 | 3-6 $\mu\text{g}/\text{m}^3$ | HPLC-UV | 10% |
| Sampling of phthalates* | ISO 16000-33:2017, MEL-09:2003 | 71M549812 | 60 L | Florisil | - |
| Analysis of phthalates* | ISO 16000-33:2017 | 71M546060 | 0.6 $\mu\text{g}/\text{m}^3$ | GC/MS | 10% |

The analysis are carried out on the sample(s) as received and the result(s) are only valid for the tested sample(s).

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4 Test Parameters, Sample Preparation and Deviations

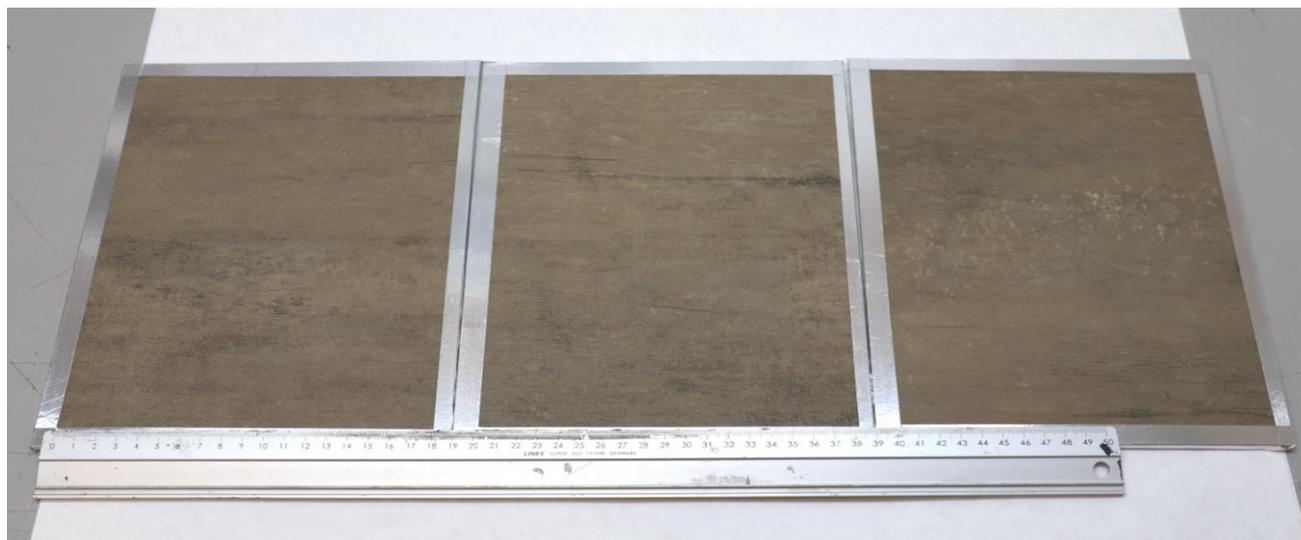
4.1 VOC Emission Chamber Test Parameters

| Parameters | Value | Sample Conditions | Value |
|--|--------|--|-------------------------|
| Chamber volume, V[L] | 119 | Date and time of unpacking | 07/09/2023 - 08:46 |
| Air change rate, n[h ⁻¹] | 0.5 | Preconditioning period | - |
| Air Velocity [m/s] | 0.1 | Chamber test period | 07/09/2023 - 05/10/2023 |
| Area specific ventilation rate, q [m/h or m ³ /m ² /h] | 0.5 | Analytical test period | 07/09/2023 - 11/10/2023 |
| Relative humidity of supply air, RH [%] | 50 ± 3 | Exposed sample area [m ²] | 0.12 |
| Temperature of supply air, T [°C] | 23 ± 1 | Loading factor [m ² /m ³] | 1.0 |
| Background concentration of individual VOC's [µg/m ³] | < 2 | Test scenario | Wall |
| Background concentration of TVOC [µg/m ³] | < 20 | Sample thickness [mm] | 4.1 |

4.2 Preparation of the Test Specimen

Edges and back were covered with aluminium foil and aluminium tape.

4.3 Picture of Sample



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4.4 Deviations from Referenced Protocols and Regulations

No deviations from the referenced test methods were observed.

4.5 Air Samplings from the Test Chamber

| Sampling media | Day (yyyy-mm-dd) | Time (hh:mm) | Volume [L] |
|----------------------------|------------------|---------------|------------|
| 3 Day, DNPH silicagel | 2023-09-10 | 09:00 - 10:49 | 34 |
| 3 Day-Res, DNPH silicagel | 2023-09-10 | 09:00 - 10:49 | 36 |
| 3 Day, Tenax TA | 2023-09-10 | 09:01 - 10:00 | 5.2 |
| 3 Day-Res, Tenax TA | 2023-09-10 | 10:01 - 10:49 | 2.3 |
| 28 Day, Florisil | 2023-10-05 | 06:40 - 09:11 | 61 |
| 28 Day-Res, Florisil | 2023-10-05 | 06:41 - 09:11 | 60 |
| 28 Day, DNPH silicagel | 2023-10-05 | 10:47 - 12:37 | 36 |
| 28 Day-Res, DNPH silicagel | 2023-10-05 | 10:48 - 12:37 | 36 |
| 28 Day, Tenax TA | 2023-10-05 | 10:49 - 11:49 | 5.1 |
| 28 Day-Res, Tenax TA | 2023-10-05 | 11:49 - 12:38 | 2.2 |

5 Results

5.1 VOC Emission Test Results after 3 Days

| | CAS No. | Retention time [min] | ID-Cat | Specific Conc. [µg/m ³] | Toluene eq. [µg/m ³] | Specific SER [µg/(m ² ·h)] | R _D | R _B |
|--|------------|-------------------------|--------|--|-------------------------------------|--|----------------|----------------|
| VOC with NIK/LCI | | | | | | | | |
| Methylethylketone (MEK) ^a | 78-93-3 | 2.07 | 1 | 7.1 | < 5 | 3.6 | 0.0004 | 0.0004 |
| Methylisobutyl ketone | 108-10-1 | 3.57 | 1 | 7.4 | < 5 | 3.7 | 0.0074 | 0.0074 |
| Butyl acetate | 123-86-4 | 5.19 | 1 | 33 | 17 | 17 | 0.0070 | 0.0070 |
| Cyclohexanone [*] | 108-94-1 | 6.78 | 1 | 9.4 | 6.1 | 4.7 | 0.023 | 0.023 |
| Benzaldehyde ^e | 100-52-7 | 7.98 | 1 | 5.5 | < 5 | 2.7 | 0.061 | 0.061 |
| Phenol [*] | 108-95-2 | 8.28 | 1 | 16 | 9.3 | 7.9 | 0.23 | 0.23 |
| VOC without NIK/LCI | | | | | | | | |
| Methyl Benzoylformate [*] | 15206-55-0 | 12.35 | 2 | 7.9 | 7.9 | 3.9 | | |
| Sum of VOC without NIK/LCI | | | | 7.9 | 7.9 | 3.9 | | |
| VVOC compounds | | | | | | | | |
| None determined | | | | | | | | |
| TVOC | | | | < 5 | < 5 | < 3 | | |
| SVOC compounds | | | | | | | | |
| Benzophenone ^e [*] | 119-61-9 | 15.54 | 2 | 6.4 | 6.4 | 3.2 | | |
| TSVOC | | | | 6.4 | 6.4 | 3.2 | | |
| Carcinogens | | | | | | | | |
| Total carcinogens | | | | < 1 | < 1 | < 1 | | |
| Aldehydes | | | | | | | | |
| Formaldehyde | 50-00-0 | | 1 | 7.0 | | 3.5 | 0.070 | 0.070 |
| Acetaldehyde | 75-07-0 | | 1 | < 3 | | < 2 | | |
| Propionaldehyde | 123-38-6 | | 1 | < 3 | | < 2 | | |
| Butyraldehyde | 123-72-8 | | 1 | < 3 | | < 2 | | |
| Acrolein [*] | 107-02-8 | | 1 | < 5 | | < 3 | | |
| 2-Butenal [*] | 123-73-9 | | 1 | < 5 | | < 3 | | |
| Glutaraldehyde [*] | 111-30-8 | | 1 | < 5 | | < 3 | | |
| R-values | | | | | | | 0.40 | 0.40 |
| TVOC | | | | 86 | 41 | 43 | | |

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5.2 VOC Emission Test Results after 28 Days

| | CAS No. | Retention time [min] | ID-Cat | Specific Conc. [µg/m³] | Toluene eq. [µg/m³] | Specific SER [µg/(m²·h)] | R _D | R _B |
|-----------------------------------|----------|-------------------------|--------|---------------------------|------------------------|-----------------------------|----------------|----------------|
| VOC with NIK/LCI | | | | | | | | |
| Butyl acetate | 123-86-4 | 5.18 | 1 | 19 | 9.8 | 9.5 | 0.0039 | 0.0039 |
| Phenol * | 108-95-2 | 8.27 | 1 | 11 | 6.5 | 5.5 | 0.16 | 0.16 |
| VOC without NIK/LCI | | | | | | | | |
| None determined | | | | | | | | |
| Sum of VOC without NIK/LCI | | | | < 5 | < 5 | < 3 | | |
| VVOC compounds | | | | | | | | |
| None determined | | | | | | | | |
| TVOC | | | | < 5 | < 5 | < 3 | | |
| SVOC compounds | | | | | | | | |
| Benzophenone ^e * | 119-61-9 | 15.54 | 1 | 6.5 | 6.5 | 2.7 | | |
| TSVOC | | | | 5.4 | 6.5 | 2.7 | | |
| Carcinogens | | | | | | | | |
| Total carcinogens | | | | < 1 | < 1 | < 1 | | |
| CMR (French reg.) | | | | | | | | |
| Benzene | 71-43-2 | | 1 | < 1 | | < 1 | | |
| Trichloroethylene | 79-01-6 | | 1 | < 1 | | < 1 | | |
| Dibutylphthalate (DBP)* | 84-74-2 | | 1 | < 1 | | < 1 | | |
| Diethylhexylphthalate (DEHP)* | 117-81-7 | | 1 | < 1 | | < 1 | | |
| Aldehydes | | | | | | | | |
| Formaldehyde | 50-00-0 | | 1 | < 3 | | < 2 | | |
| Acetaldehyde | 75-07-0 | | 1 | < 3 | | < 2 | | |
| Propionaldehyde | 123-38-6 | | 1 | < 3 | | < 2 | | |
| Butyraldehyde | 123-72-8 | | 1 | < 3 | | < 2 | | |
| Acrolein * | 107-02-8 | | 1 | < 5 | | < 3 | | |
| 2-Butenal * | 123-73-9 | | 1 | < 5 | | < 3 | | |
| Glutaraldehyde * | 111-30-8 | | 1 | < 5 | | < 3 | | |
| R-values | | | | | | | 0.16 | 0.16 |
| TVOC | | | | 30 | 16 | 15 | | |
| TVOC (French label) | | | | | 27 | | | |

The analysis are carried out on the sample(s) as received and the result(s) are only valid for the tested sample(s).

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| | CAS No. | Retention time [min] | ID-Cat | Specific Conc. [µg/m ³] | Toluene eq. [µg/m ³] | Specific SER [µg/(m ² ·h)] | R_D | R_B |
|------------------------|----------------|--------------------------------|---------------|---|--|---|----------------------|----------------------|
| Toluene | 108-88-3 | | | < 2 | < 2 | < 1 | | |
| Tetrachloroethylene | 127-18-4 | | | < 2 | < 2 | < 1 | | |
| Ethylbenzene | 100-41-4 | | | < 2 | < 2 | < 1 | | |
| Xylene | 1330-20-7 | | | < 2 | < 2 | < 1 | | |
| Styrene | 100-42-5 | | | < 2 | < 2 | < 1 | | |
| 2-Butoxyethanol | 111-76-2 | | | < 2 | < 2 | < 1 | | |
| 1,2,4-Trimethylbenzene | 95-63-6 | | | < 2 | < 2 | < 1 | | |
| 1,4-Dichlorobenzene | 106-46-7 | | | < 2 | < 2 | < 1 | | |

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6 Summary and Evaluation of the Results

6.1 Comparison with Limit Values of the French VOC Regulation

| | CAS No. | Conc. 28 days $\mu\text{g}/\text{m}^3$ |  $\mu\text{g}/\text{m}^3$ |  $\mu\text{g}/\text{m}^3$ |  $\mu\text{g}/\text{m}^3$ |  $\mu\text{g}/\text{m}^3$ |
|------------------------|-----------|--|--|---|---|---|
| TVOC | - | 27 | > 2000 | < 2000 | < 1500 | < 1000 |
| Formaldehyde | 50-00-0 | < 3 | > 120 | < 120 | < 60 | < 10 |
| Acetaldehyde | 75-07-0 | < 3 | > 400 | < 400 | < 300 | < 200 |
| Toluene | 108-88-3 | < 2 | > 600 | < 600 | < 450 | < 300 |
| Tetrachloroethylene | 127-18-4 | < 2 | > 500 | < 500 | < 350 | < 250 |
| Ethylbenzene | 100-41-4 | < 2 | > 1500 | < 1500 | < 1000 | < 750 |
| Xylene | 1330-20-7 | < 2 | > 400 | < 400 | < 300 | < 200 |
| Styrene | 100-42-5 | < 2 | > 500 | < 500 | < 350 | < 250 |
| 2-Butoxyethanol | 111-76-2 | < 2 | > 2000 | < 2000 | < 1500 | < 1000 |
| 1,2,4-Trimethylbenzene | 95-63-6 | < 2 | > 2000 | < 2000 | < 1500 | < 1000 |
| 1,4-Dichlorobenzene | 106-46-7 | < 2 | > 120 | < 120 | < 90 | < 60 |

The product was assigned a VOC emission class without taking into account the measurement uncertainty associated with the result. As specified in French Decree no. 2011-321 of March 23 2011, correct assignment of the VOC emission class is the sole responsibility of the party responsible for distribution of the product in the French market.

6.2 Comparison with Limit Values of the CMR Components

| CMR (French reg.) | CAS No. | Conc. 28 days $\mu\text{g}/\text{m}^3$ | Max. allowed air concentration $\mu\text{g}/\text{m}^3$ |
|-------------------------------|----------|--|--|
| Benzene | 71-43-2 | < 1 | < 1 |
| Trichloroethylene | 79-01-6 | < 1 | < 1 |
| Dibutylphthalate (DBP)* | 84-74-2 | < 1 | < 1 |
| Diethylhexylphthalate (DEHP)* | 117-81-7 | < 1 | < 1 |

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6.3 Comparison with Limit Values of the Italian CAM Regulation

| | CAS No. | Conc. 28 days µg/m³ | Limit value 28 days µg/m³ |
|-------------------------------|----------------|---|---|
| TVOC | - | 27 | < 1500 |
| Formaldehyde | 50-00-0 | < 3 | < 60 |
| Acetaldehyde | 75-07-0 | < 3 | < 300 |
| Toluene | 108-88-3 | < 2 | < 450 |
| Tetrachloroethylene | 127-18-4 | < 2 | < 350 |
| Ethylbenzene | 100-41-4 | < 2 | < 1000 |
| Xylene | 1330-20-7 | < 2 | < 300 |
| Styrene | 100-42-5 | < 2 | < 350 |
| 2-Butoxyethanol | 111-76-2 | < 2 | < 1500 |
| 1,2,4-Trimethylbenzene | 95-63-6 | < 2 | < 1500 |
| 1,4-Dichlorobenzene | 106-46-7 | < 2 | < 90 |
| Benzene | 71-43-2 | < 1 | < 1 |
| Trichloroethylene | 79-01-6 | < 1 | < 1 |
| Dibutylphthalate (DBP)* | 84-74-2 | < 1 | < 1 |
| Diethylhexylphthalate (DEHP)* | 117-81-7 | < 1 | < 1 |

The product was assigned a VOC emission class without taking into account the measurement uncertainty associated with the result.

6.4 Comparison with Limit Values of AgBB/ABG

| Parameters | Test after 3 days | | Test after 28 days | |
|----------------------------|------------------------------------|----------------------------------|------------------------------------|----------------------------------|
| | Concentration mg/m ³ | Limit Value mg/m ³ | Concentration mg/m ³ | Limit Value mg/m ³ |
| TVOC | 0.086 | ≤ 10 | 0.030 | ≤ 1.0 |
| TSVOC | 0.0064 | - | 0.0054 | ≤ 0.1 |
| R-value (dimensionless) | 0.40 | - | 0.16 | ≤ 1 |
| Sum of VOC without NIK/LCI | 0.0079 | - | < 0.005 | ≤ 0.1 |
| Formaldehyde | - | - | < 0.003 | ≤ 0.1 |
| Total carcinogens | < 0.001 | ≤ 0.01 | < 0.001 | ≤ 0.001 |

Compliance with the limits alone does not replace an approval or voluntary documentation by a Technical Assessment Body according to the Construction Product Regulation. This requires an application and approval.

6.5 Comparison with Limit Values of the Belgian Regulation

| Parameters | Test after 28 days | |
|-------------------------|------------------------------------|----------------------------------|
| | Concentration µg/m ³ | Limit Value µg/m ³ |
| TVOC (EN 16516) | 16 | ≤ 1000 |
| TSVOC | 6.5 | ≤ 100 |
| R-value (dimensionless) | 0.16 | ≤ 1 |
| Total carcinogens | < 1 | ≤ 1 |
| Toluene | < 5 | ≤ 300 |
| Formaldehyde | < 3 | ≤ 100 |
| Acetaldehyde | < 3 | ≤ 200 |

6.6 Comparison with Limit Values of LEED v4.1 BETA

| Parameters | Test after 28 days | |
|----------------------------|------------------------------------|----------------------------------|
| | Concentration µg/m ³ | Limit Value µg/m ³ |
| TVOC | 30 | ≤ 1000 |
| Sum of VOC without NIK/LCI | < 5 | < 100 |
| Formaldehyde | < 3 | ≤ 10 |
| R-value (dimensionless) | 0.16 | ≤ 1 |

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6.7 Comparison with Limit Values of BREEAM NOR

| Parameters | Concentration mg/m ³ | Basic Level mg/m ³ | Exemplary Level mg/m ³ |
|---------------------------|------------------------------------|----------------------------------|--------------------------------------|
| Formaldehyde 28 days | < 0.003 | ≤ 0.06 | ≤ 0.01 |
| TVOC (EN 16516) 28 days | 0.016 | ≤ 0.3 | ≤ 0.3 |
| TSVOC 28 days | 0.0065 | - | ≤ 0.1 |
| total carcinogens 28 days | < 0.001 | ≤ 0.001 | ≤ 0.001 |

6.8 Comparison with Limit Values of BREEAM International

| Parameters | Concentration mg/m ³ | Basic Level mg/m ³ | Exemplary Level mg/m ³ |
|---------------------------|------------------------------------|----------------------------------|--------------------------------------|
| Formaldehyde 28 days | < 0.003 | ≤ 0.06 | ≤ 0.01 |
| TVOC (EN 16516) 28 days | 0.016 | ≤ 1.0 | ≤ 0.3 |
| TSVOC 28 days | 0.0065 | - | ≤ 0.1 |
| total carcinogens 28 days | < 0.001 | ≤ 0.001 | ≤ 0.001 |

6.9 Comparison with Limit Values of EU Taxonomy

| Parameters | Test after 28 days | |
|----------------------------|------------------------------------|----------------------------------|
| | Concentration mg/m ³ | Limit Value mg/m ³ |
| Formaldehyde | < 0.002 | ≤ 0.06 |
| Any individual carcinogens | < 0.001 | < 0.001 |

The formaldehyde emission is tested according to EN 16516 with air change rate 0.5 /h and relative humidity of 50 ± 5 %. Results have been recalculated to a loading of 1 m²/m³ and air change rate of 1 /h.

6.10 Comparison with Limit Values of Indoor Air Comfort

| | Test after 3 days | | Test after 28 days | |
|--|------------------------------------|----------------------------------|------------------------------------|----------------------------------|
| | Concentration µg/m ³ | Limit Value µg/m ³ | Concentration µg/m ³ | Limit Value µg/m ³ |
| TVOC (EN 16516) | 41 | ≤ 10000 | 16 | ≤ 1000 |
| TSVOC | 6.4 | - | 6.5 | ≤ 100 |
| R_D-value (NIK) (dimensionless) | 0.40 | - | 0.16 | ≤ 1 |
| R_B-value (LCI) (dimensionless) | 0.40 | - | 0.16 | ≤ 1 |
| Sum of VOC without NIK/LCI | 7.9 | - | < 5 | ≤ 100 |
| Total carcinogens | < 1 | ≤ 10 | - | - |
| Any individual carcinogens | - | - | < 1 | ≤ 1 |
| CMR (French reg.) | - | - | < 1 | ≤ 1 |
| Formaldehyde | 7.0 | - | < 3 | ≤ 60 |
| Acetaldehyde | < 3 | - | < 3 | ≤ 200 |
| French A+/A | - | - | Complies | |

Compliance with the limits alone does not entitle to use the Indoor Air Comfort label. This requires an application, site inspection, and approval. See www.eurofins.com/iac-procedures.

6.11 Comparison with Limit Values of Indoor Air Comfort Gold

| | Test after 3 days | | Test after 28 days | |
|--|------------------------------------|----------------------------------|------------------------------------|----------------------------------|
| | Concentration µg/m ³ | Limit Value µg/m ³ | Concentration µg/m ³ | Limit Value µg/m ³ |
| TVOC (EN 16516) | 41 | ≤ 1000 | 16 | ≤ 60 |
| TSVOC | 6.4 | - | 6.5 | ≤ 20 |
| R_D-value (NIK) (dimensionless) | 0.40 | - | 0.16 | ≤ 1 |
| R_B-value (LCI) (dimensionless) | 0.40 | - | 0.16 | ≤ 1 |
| Sum of VOC without NIK/LCI | 7.9 | - | < 5 | ≤ 40 |
| Total carcinogens | < 1 | ≤ 10 | - | - |
| Any individual carcinogens | - | - | < 1 | ≤ 1 |
| CMR (French reg.) | - | - | < 1 | < 1 |
| Formaldehyde | 7.0 | ≤ 50 | < 3 | < 10 |
| Acetaldehyde | < 3 | ≤ 50 | < 3 | ≤ 50 |
| Sum Formaldehyde + Acetaldehyde [ppb] | 5.7 | ≤ 50 | - | - |
| French A+ | - | - | Complies | |

Compliance with the limits alone does not entitle to use the Indoor Air Comfort GOLD label. This requires an application, site inspection, and approval. See www.eurofins.com/iac-procedures.

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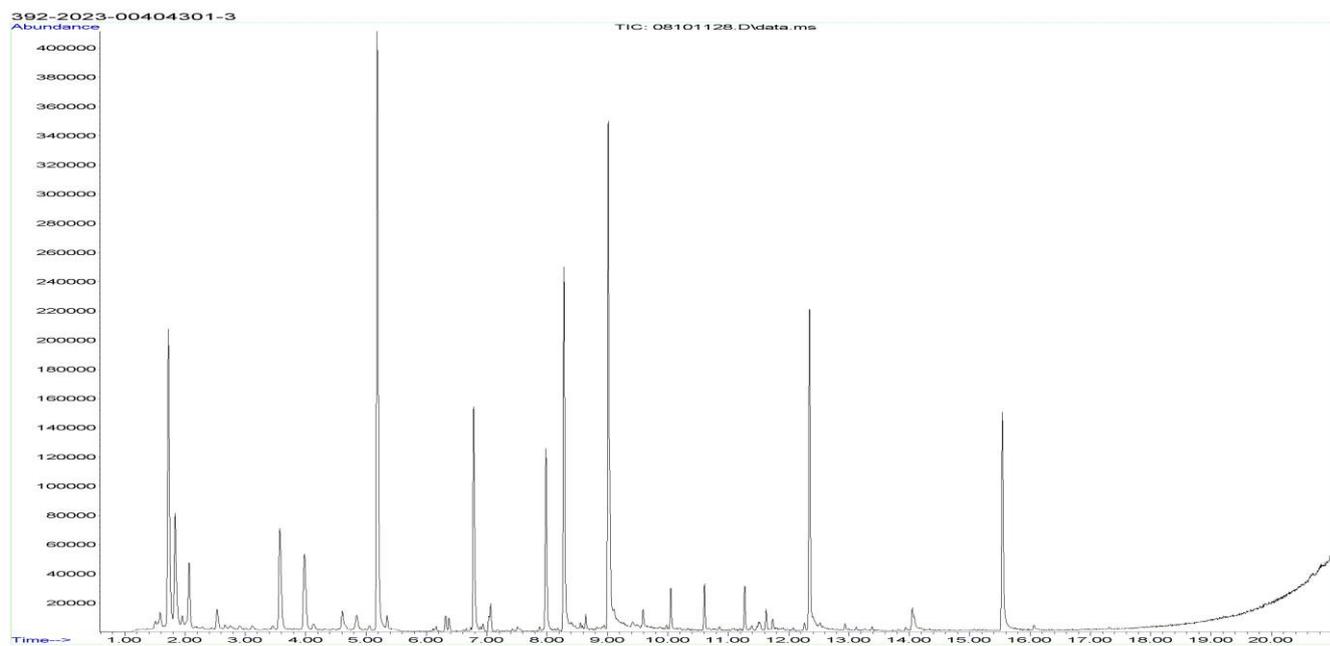
6.12 Comparison with Limit Values of EMICODE

| Parameters | Concentration $\mu\text{g}/\text{m}^3$ | EC 2 $\mu\text{g}/\text{m}^3$ | EC 1 $\mu\text{g}/\text{m}^3$ | EC 1 PLUS $\mu\text{g}/\text{m}^3$ |
|---------------------------------------|---|----------------------------------|----------------------------------|---------------------------------------|
| TVOC 3 days (EN 16516) | 41 | ≤ 3000 | ≤ 1000 | ≤ 750 |
| TVOC 28 days (EN 16516) | 16 | ≤ 300 | ≤ 100 | ≤ 60 |
| TSVOC 28 days (EN 16516) | 6.5 | ≤ 100 | ≤ 50 | ≤ 40 |
| Sum without NIK/LCI 28 days | < 5 | > 40 | | ≤ 40 |
| R-value 28 days (dimensionless) | 0.16 | > 1 | | ≤ 1 |
| Formaldehyde 3 days | 7.0 | ≤ 50 | | |
| Acetaldehyde 3 days | < 3 | ≤ 50 | | |
| Sum Formaldehyde + Acetaldehyde [ppm] | 0.0057 | ≤ 0.05 | | |
| Sum carcinogens 3 days | < 1 | ≤ 10 | | |
| Sum carcinogens 28 days | < 1 | ≤ 1 | | |

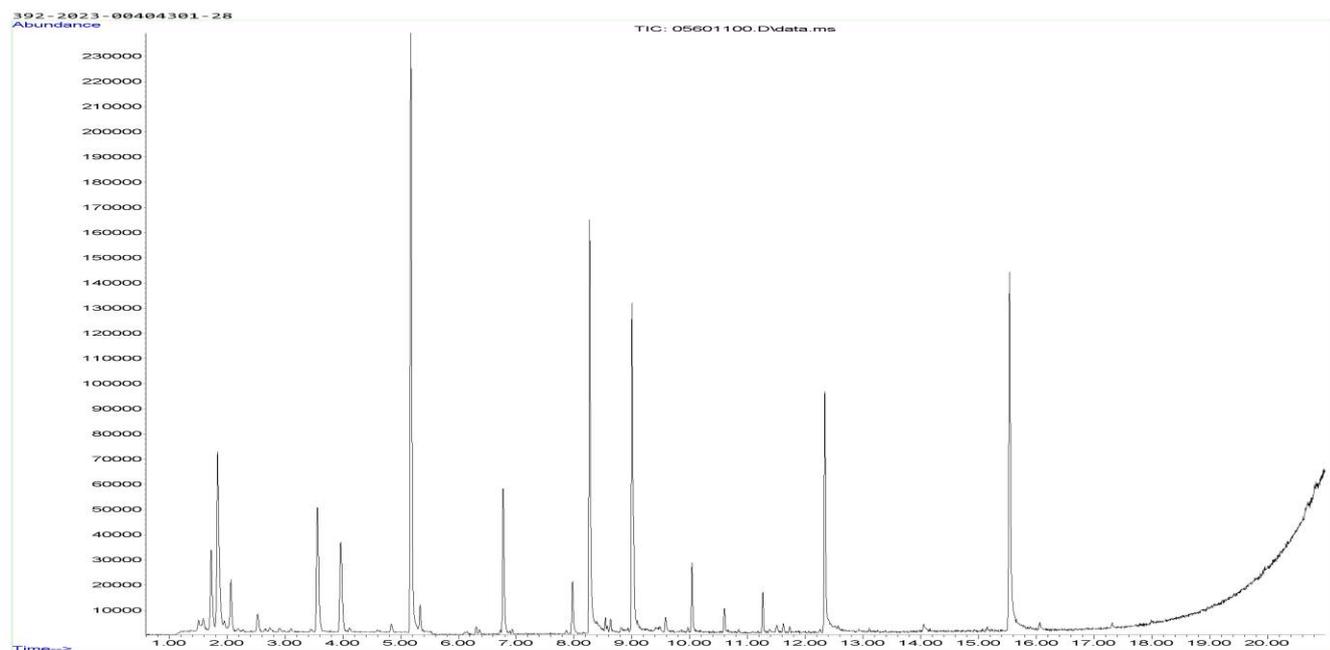
This test report does not alone entitle to use the protected trademark label EMICODE. For the use of an EMICODE label a license has to be applied for at the GEV, Düsseldorf, Germany. A license can only be granted for ready-to use products, if some additional requirements on contents of certain chemicals (e.g. solvent-free) are fulfilled.

7 Appendices

7.1 Chromatogram of VOC Emissions after 3 Days



7.2 Chromatogram of VOC Emissions after 28 Days



Please consider the different scales.

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7.3 Sampling Report



01 31-
Init./dt: Ec/10:00

| Combined Sampling Report and Chain of Custody | |
|--|--|
| Name of applicant: Maryam Sobhani, Falquon GmbH, Am Hünengrab 18, , 16928 Pritzwalk, Germany (name, company, phone) | |
| Product information | |
| Name of the product: The Wall | Product type: SPC |
| Batch N°: FA010609-001 | Article N°: |
| Model / Program / Series: | Manufacture: Falquon GmbH, Am Hünengrab 18, , 16928 Pritzwalk, Germany (Company, Address, Stamp) |
| Production & Sampling information | |
| Production Date: FA010609-001 Time: 07:28:00 | Sampling Date: Mittwoch, 23. August 2023 Time: |
| Place of sampling (if deviating from the manufacture) | Sample is taken from: <input checked="" type="checkbox"/> ongoing production <input type="checkbox"/> stocks <input type="checkbox"/> retained sample |
| | Number of samples: |
| Person in charge of sampling: (Name, company, telephone) | Signature of sample collector: |
| Where has the product been stored prior to sampling? <input checked="" type="checkbox"/> production <input type="checkbox"/> store <input type="checkbox"/> miscellaneous | How has the product been stored prior to sampling? <input checked="" type="checkbox"/> open <input type="checkbox"/> in the stack <input type="checkbox"/> wrapped up |
| Place of storage: | Packing material: |
| Specifics (possible negative influences by air contamination where sample was taken, by petrol emissions, by solvent emissions from production; any other uncertainties, questions, etc). <p style="text-align: right;">possibility to expose to the wood dust</p> | |
| Cut edges (identification of cut edges when present and identification of new surfaces and surface to be exposed in the emission test): | |
| Confirmation from the applicant | |
| Herewith the signer confirms the correctness of the data given above. The sample was selected, drawn and packed personally in accordance with the instructions for the taking of samples. | |
| Date: | Signature: |

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| | | | |
|---|---|--|------------------|
| 28.08.2023 | (Stamp) <i>Sobhy</i> Margam Sobhani |  FALQUON <small>FALQUON GmbH Am Hünengrab 1-8 16928 Pritzwalk Gewerbegebiet Pritzwalk</small> | |
| Chain of custody : +49 33986 5021-10 | | | |
| <i>Whenever the sample is handed over, please fill out the below information</i> | | | |
| Handed over between: | Initials + Signature | Date + Time | Condition |
| Handed over by | | | |
| Handed over to | | | |
| Handed over by | | | |
| Handed over to | | | |
| Handed over by | | | |
| Handed over to | | | |
| Laboratory receiving details (date, condition of package and sample, assigned lab no.): | | | |
| Receptionist, Eurofins Product Testing A/S: | | Signature of receptionist: | |
| | | | |

7.4 How to Understand the Results

7.4.1 Acronyms Used in the Report

| | |
|-----|--|
| < | Means less than |
| > | Means bigger than |
| * | Not a part of our accreditation |
| α | Please see section regarding uncertainty in the Appendices |
| § | Deviation from method. Please see deviation section |
| a | The method is not optimal for very volatile compounds. For these substances smaller results and a higher measurement uncertainty cannot be ruled out |
| b | The component originates from the substrate and is thus removed |
| c | The results have been corrected by the emission from the substrate |
| d | Very polar organic compounds are not suitable for reliable quantification using Tenax TA adsorbent and HP-5ms GC column. A high degree of uncertainty must be expected |
| e | The component may be overestimated due to contribution from the system |
| SER | Specific Emission Rate |

7.4.2 Explanation of ID Category

Categories of Identity:

- 1: Identified by comparison with a mass spectrum obtained from library and supported by other information and quantified through specific calibration.
- 2: Identified by comparison with a mass spectrum obtained from library and supported by other information. Quantified as toluene equivalent.
- 3: Identified with a lower match by comparison with a mass spectrum obtained from a library. Quantified as toluene equivalent.
- 4: Not identified, quantified as toluene equivalent.

7.5 Applied LCI and NIK Values

7.5.1 LCI/NIK Values for Compounds found after 3 Day Measurements

| Compound | CAS No. | AgBB 2021 NIK | Belgian NIK |
|--------------------------------------|----------|----------------------|----------------------|
| | | [µg/m ³] | [µg/m ³] |
| Methylethylketone (MEK) ^a | 78-93-3 | 20000 | 20000 |
| Methylisobutyl ketone | 108-10-1 | 1000 | 1000 |
| Butyl acetate | 123-86-4 | 4800 | 4800 |
| Cyclohexanone [*] | 108-94-1 | 410 | 410 |
| Benzaldehyde ^e | 100-52-7 | 90 | 90 |
| Phenol [*] | 108-95-2 | 70 | 70 |
| Formaldehyde | 50-00-0 | 100 | 100 |

7.5.2 LCI/NIK Values for Compounds found after 28 Day Measurements

| Compound | CAS No. | AgBB 2021 NIK | Belgian NIK |
|---------------------|----------|----------------------|----------------------|
| | | [µg/m ³] | [µg/m ³] |
| Butyl acetate | 123-86-4 | 4800 | 4800 |
| Phenol [*] | 108-95-2 | 70 | 70 |

7.6 Description of VOC Emission Test

7.6.1 Test Chamber

The test chamber is made of stainless steel. A multi-step air clean-up is performed before loading the chamber, and a blank check of the empty chamber is performed.

The chamber operation parameters are as described in the test method section. (EN 16516, ISO 16000-9, internal method no.: 71M549811).

The recovery rates in the climate test chamber have been investigated using toluene and n-dodecane. The mean recovery rates of toluene and n-dodecane were concluded to be between 95 % and 100 % depending on the chamber size. These values comply with the criteria of a minimum mean recovery rate of 80 % stated in the 16000-9 test method.

Air sampling from the test chamber is carried out in a clean test chamber room at ambient air pressure and 23 ± 1 °C.

7.6.2 Expression of the Test Results

All test results are calculated as specific emission rate, and as extrapolated air concentration in the European Reference Room (EN 16516, AgBB, EMICODE, M1 and Indoor Air Comfort).

7.6.3 Testing of Carcinogenic VOCs

The emission of carcinogens (EU Categories C1A and C1B, as per European law) is tested by drawing sample air from the test chamber outlet through Tenax TA tubes after the specified duration of storage in the ventilated test chamber. Analysis is performed by ATD-GC/MS (automated thermal desorption coupled with gas chromatography and mass spectroscopy using 30 m HP-5 (slightly polar) column with 0.25 mm ID and 0.25 µm film, Agilent) (EN 16516, ISO 16000-6, internal methods no.: 71M549812 / 71M542808B).

All identified carcinogenic VOCs are listed; if a carcinogenic VOC is not listed then it has not been detected. Quantification is performed using the TIC signal and authentic response factors, or the relative response factors relative to toluene for the individual compounds.

This test only covers substances that can be adsorbed on Tenax TA and can be thermally desorbed. If other emissions occur, then these substances cannot be detected (or with limited reliability only).

7.6.4 Testing of VOC, SVOC and VVOC

The emissions of volatile organic compounds are tested by drawing sample air from the test chamber outlet through Tenax TA tubes after the specified duration of storage in the ventilated test chamber. Analysis is performed by ATD-GC/MS using HP-5 column (30 m, 0.25mm ID, 0.25µm film) (EN 16516, ISO 16000-6, internal methods no.: 71M549812 / 71M542808B).

All single substances that are listed with a LCI/NIK value in the latest publications (hereafter referred to as target compounds) are identified if present. All other appearing VOCs are identified as far as possible. Quantification of target compounds is done using the TIC signal and authentic response factors, or the relative response factors relative to toluene. For certain compound groups, which differ significantly in chemistry from toluene, quantification is performed relative to a representative member of the group for more accurate and precise results. This can include quantification of for example glycols and acids. In addition to that, all results are also expressed in toluene equivalents. All non-target compounds, as well as all non-identified substances, are quantified in toluene equivalents.

The results of the individual substances are calculated in three groups depending on their retention time when analyzing using a non-polar column (HP-1):

- Volatile Organic Compounds (VOC) are defined as: All substances eluting between and including n-hexane (n-C6) and n-hexadecane (n-C16)

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- Semi-Volatile Organic Compounds (SVOC) are defined as: All substances eluting after n-hexadecane (n-C16) and before and including n-docosane (n-C22)
- Very Volatile Organic Compounds (VVOC) are defined as: All substances eluting before n-hexane (n-C6).

Total Volatile Organic Compounds (TVOC) is calculated by summation of all individual VOCs with a concentration $\geq 5 \mu\text{g}/\text{m}^3$. The TVOC can be expressed either in toluene equivalents as defined in EN 16516 and similar to ISO 16000-6, or as the sum of concentrations using specific or relative response factors. In the case of summation of concentrations using authentic or relative response factors, the toluene equivalent is applied to all non-target and non-identified VOCs before summing up. Compounds regarded as VOC in line with the above definition but elute before n-C6 or after n-C16 on the HP-5 column are treated as VOC, and are thus added to the TVOC.

Total Semi-Volatile Organic Compounds (TSVOC) is calculated by the summation of all individual SVOCs expressed in toluene equivalents with a concentration $\geq 5 \mu\text{g}/\text{m}^3$, as defined in EN 16516. VOCs that are regarded as VOC in line with the above definition, but elute after n-C16 in this test, are not added to the TSVOC.

Total Very Volatile Organic Compounds (TVVOC) is calculated by the summation of all individual VVOCs with a concentration $\geq 5 \mu\text{g}/\text{m}^3$ and expressed in toluene equivalents. VOCs that are regarded as VOC in line with the above definition, but elute before n-C6 in this test, are not added to the TVVOC.

This test only covers substances which can be adsorbed on Tenax TA and can be thermally desorbed. If emissions of substances outside these specifications occur then these substances cannot be detected (or with limited reliability only).

7.6.5 Calculation of R Values with LCI Lists

The concentrations of detected compounds $\geq 5 \mu\text{g}/\text{m}^3$ are divided by their respective LCI/NIK value (if defined in the given publication). The sum of the quotients gives the R value, which can be mathematically expressed:

$$R = \sum_1^n \left(\frac{c_i}{\text{NIK}_i} + \dots + \frac{c_n}{\text{NIK}_n} \right)$$

This R value is calculated, depending on the purpose of this test, for the European LCI list, for the German LCI/NIK list (R_D), and/or for the Belgian LCI list (R_B).

All VOCs without published LCI/NIK value and concentration $\geq 5 \mu\text{g}/\text{m}^3$ are summed up as sum of VOCs without LCI/NIK if required by the standard or protocol.

7.6.6 Testing of Aldehydes

The presence of aldehydes is tested by drawing air samples from the test chamber outlet through DNPH-coated silicagel tubes after the specified duration of storage in the ventilated test chamber. Analysis is performed by solvent desorption and subsequently by HPLC and UV-/diode array detection.

The absence of formaldehyde and other aldehydes is stated if UV detector response at the specific wavelength is lacking at the specific retention time in the chromatogram. Otherwise it is checked whether the reporting limit is exceeded. In this case the identity is finally checked by comparing full scan sample UV spectra with full scan standard UV spectra.

Conversions of specific aldehydes from $\mu\text{g}/\text{m}^3$ to ppm are done by the ideal gas law using a temperature of 23 degree Celsius and standard atmospheric pressure.

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7.6.7 Testing of Phthalates

The presence of phthalates is tested by drawing air samples from the test chamber outlet through tube with Florisil adsorbent after the specified duration of storage in the ventilated test chamber. Analysis is performed by solvent desorption and subsequently by GC/MS. Analysis of phthalates is not currently covered by the accreditation (Internal methods no.: 71M549812 / 71M546060).

7.7 Quality Assurance

Before loading the test chamber, a blank check of the empty chamber is performed and compliance with background concentrations in accordance with EN 16516 / ISO 16000-9 is determined.

Air sampling at the chamber outlet and subsequent analysis is performed in duplicate. Relative humidity, temperature and air change rate in the chambers is logged every 5 minutes and checked daily. A double determination is performed on random samples at a regular interval and results are registered in a control chart to ensure the uncertainty and reproducibility of the method.

The stability of the analytical system is checked by a general function test of device and column, and by use of control charts for monitoring the response of individual substances prior to each analytical sequence.

7.8 Accreditation

The testing methods described above are accredited on line with EN ISO/IEC 17025 by DANAK (no. 522). This accreditation is valid worldwide due to mutual approvals of the national accreditation bodies (ILAC/IAF, see also www.eurofins.com/galten.aspx#accreditation).

Not all parameters are covered by this accreditation. The accreditation does not cover parameters marked with an asterisk (*), however analysis of these parameters is conducted at the same level of quality as for the accredited parameters.

7.9 Uncertainty of the Test Method

The relative standard deviation of the overall analysis is 22%. The expanded uncertainty U_m equals 2 x RSD. For further information please visit www.eurofins.dk/product-testing/uncertainty/.

7.10 Decision Rules

Eurofins Product Testing A/S, declare statement of conformity based on the "Binary Statement for Simple Acceptance Rule" described in ILAC's "Guidelines on decision Rules and Statements of Conformity" ILAC-G8:09/2019.

This means that results above the detection limit are always reported with two significant digits. Results are evaluated with the same number of significant digits as the corresponding limit values, and conformity is based on results being less than or equal to limit values.

For limit values with more than two significant digits, the third digit will be used to confirm whether a result is below or equal to the limit value. It will always be indicated in the evaluation table if this expanded evaluation is performed.

For further information, please visit www.eurofins.dk/product-testing/om-os/beslutningsregler/

7.11 Version History

| Report date | Report number | Modification |
|-------------|------------------------|-----------------|
| 13/10/2023 | 392-2023-00404301_A_EN | Current version |

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