

Indoor environmental quality in the WELL certification

What Nuvap can do

1. WELL CERTIFICATION	3
1. INTRODUCTION	3
2. REGISTRATION	3
3. DOCUMENTATION REQUIREMENTS	3
4. PRE-CERTIFICATION	4
5. WELL DESIGN & OPERATION (WELL&DO)	4
6. DOCUMENTATION REVIEW	4
7. PERFORMANCE CHECK	4
8. WELL REPORT	4
9. CERTIFICATION E MONITORING	4
2. AIR QUALITY	5
1. CERTIFICATION & RI-CERTIFICATION	5
2. CONTINUOUS MONITORING	5
3. INITIATIVES FOR AWARENESS	6

1. WELL Certification

1. INTRODUCTION

The WELL certification is the reference standard for buildings, interior spaces and communities that seek to implement, validate and measure the factors that promote human health and well-being.

The intent of the promoters (IWBI) is to advance human health through better buildings. The certification process extends to ten main concepts: Air, Water, Nutrition, Light, Movement, Thermal Comfort, Sound, Materials, Mental Wellbeing and Community.

Each area has characteristics with different impacts on health. For each of them, the certification process involves an evaluation according to a system of scores. The total points achieved according to the predefined rules allows the achievement of four certification levels:

- Well Bronze
- Well Silver
- Well Gold
- Well Platinum

To date, two certification paths are available, WELL1 and WELL2, which differ in the breadth of areas (WELL 2 includes Thermal comfort, Sound, Materials and Communities, which were not included in WELL 1), as well as for some requirements and optimisations . In essence, WELL2 is more flexible and is open to existing buildings.

The certification process is based on 4 fundamental steps:

- Assessment
- Implementation
- Verification
- Monitoring

2. REGISTRATION

The registration phase allows communicating the intention to start the certification process, communicating basic information about the project and purpose and defining the type of certification to be pursued (WELL V1, WELL V2). The main information concern the size of the building concerned (in sm).

3. DOCUMENTATION REQUIREMENTS

The WELL protocol requires the submission of documentation that demonstrates the compliance with the protocol's requirements. All documents, like the entire certification process, is managed through an online platform, available from the registration on. There are three main types of documents:

Annotated Document: existing documentation regarding the projects, which can be used to meet the WELL requirements (Design, Construction, Operations Planning, Policies, Materials,...).

Letter of Assurance: documentation produced by professionals that confirm the successful execution and compliance with a specific requirement (Properties, Architects, Contractors, MEP Engineers).

General Document: generic documentation to support the project (WELL signed certification agreement, Project checklist, Building maps, Mechanical drawings, Description of the project and the features to be implemented, Proof of work completion).

4. PRE-CERTIFICATION

Pre-certification is only available for WELL 1 and is optional. It aims to demonstrate to potential drivers the health and wellbeing conditions offer and what approach and investments are needed to achieve the full WELL Certification.

5. WELL DESIGN & OPERATION (WELL&DO)

For WELL 2 certification projects it is possible to envisage an intermediate process review phase (Well Design & Operation). This option can help the representatives of existing projects communicate progress towards the achieving WELL certification and provide greater confidence that operational intentions and / or existing conditions meet the requirements of the protocol.

6. DOCUMENTATION REVIEW

All documentation must go through the review process through the WELL Reviewer figure. Once all the documentation has been satisfactory, the next step involves checking the achieved performance.

7. PERFORMANCE CHECK

At the conclusion of the project it must be demonstrated that all the necessary requirements are met, through performance tests, which can be performed if certain eligibility criteria are met (Documentation Approval, Employment Certification, Occupation of space for at least 50% of the capacity of occupation,..)

Performance Testing Agent: the performance testing agent is a subject formed by GBCI who, according to the directives and recommendations provided, performs the measurements on the spot. The testing agent works for a "WELL performance testing" organisation which may be GBCI or a GBCI approved organisation (it is important that there is no conflict of interest with the current project).

8. WELL REPORT

The WELL report provides an assessment for each individual feature and requirement envisaged in the certification process. If the project has not achieved the set objectives, the report will indicate the non-conformity and it will be possible to implement corrective actions.

9. CERTIFICATION E MONITORING

Once all the WELL requirements have been verified, the certification is obtained. To maintain the status of a WELL certified building it is necessary to implement the monitoring and reporting activities on an annual basis, up to the re-certification.

Monitoring and reporting activities are divided into three main areas:

- Survey on building occupancy
- Tests on maintenance activities (filter replacement intervention reports, maintenance planning, etc.)
- Continuous monitoring of environmental parameters (eg air and water)

The certification has a duration of 3 years; subsequently it is necessary to activate the re-certification process. Re-certification requires that all monitoring activities and incremental progress have been performed, otherwise the certification can be revoked.

2. Air Quality

The WELL Air concept was developed with the aim of ensuring high levels of indoor air quality, during the life of a building, through different strategies that include the elimination or reduction of polluting sources, the appropriate design of active and passive buildings, operational strategies and interventions on human behaviour.

1. CERTIFICATION & RE-CERTIFICATION

The certification and re-certification process for WELL Air requires that the measurement is carried out according to the protocol defined by the IWBI, which defines the method and the type of parameters to be measured. The parameters subject to certification and re-certification are:

- VOC (volatile organic compounds)
- Carbon monoxide
- Ozone
- Nitrogen dioxide
- Radon
- Formaldehyde
- PM_{2,5} / PM₁₀ particulate matter

The benchmarks can be different, depending on whether the owner simply wants to meet the minimum requirements or achieve advanced goals.

2. CONTINUOUS MONITORING

The WELL protocol foresees the continuous monitoring of data on contaminants, to make the occupants aware of their environmental quality.

Monitoring is provided with devices that have the following requirements:

1. continuous monitoring of at least three of the following environmental parameters, within spaces regularly occupied or common in the building:
 - PM_{2.5} or PM₁₀ (precision $2 \mu\text{g} / \text{m}^3 + 15\%$ of reading at values between 0 and $150 \mu\text{g} / \text{m}^3$).
 - Carbon dioxide (precision 50 ppm + 3% of reading at values between 400 and 2000 ppm).
 - Carbon monoxide (1 ppm precision at values between 0 and 10 ppm).
 - Ozone (precision 10 ppb at values between 0 and 100 ppb).
 - Nitrogen dioxide (precision 20 ppb at values between 0 and 100 ppb).

- Total VOC (precision $20 \mu\text{g} / \text{m}^3 + 20\%$ of reading at values between 150 and $2000 \mu\text{g} / \text{m}^3$).
 - Formaldehyde (precision 20 ppb at values between 0 and 100 ppb).
2. The devices must be installed at least one per floor or one every 325 m^2 (between the two, the most rigorous criterion is followed), with the following requirements:
- $1.1\text{-}1.7 \text{ m}$ above the floor, in places where occupants usually stay.
 - at least 1 m away from doors, windows and air / exhaust vents.

Measurements are taken at intervals not exceeding 10 minutes for particulate matter and carbon dioxide and no more than an hour for the other pollutants.

The data is analysed for the hours regularly occupied (for example, median, average, 75th, 95th percentile) and sent each year through the WELL Online portal.

The devices are recalibrated or replaced every year, with documentation certifying their calibration or replacement sent every year through WELL Online.

Verification

Letter of Assurance: MEP

Annotated Document: Schedule of operations, Monitored data report, Photo verification.

The available configurations of the Nuvap devices allow the continuous monitoring of parameters required by the WELL certification during the life of the building, plus many important pollutants as well as methane, electromagnetic fields, noise and ionising radiation. To date, only ozone and nitrogen dioxide are not monitored, which will be integrated into the next version of the devices.

Furthermore, as regards water quality, the water test integrated in the Nuvap devices allows the monitoring of Chlorine and Ph, , among other factors, which are among the parameters prescribed by the WELL certification.

3. INITIATIVES FOR AWARENESS

Only if continuous monitoring is implemented properly, it is possible to take advantage of initiatives to promote awareness of Air Quality issues, obtaining an additional score. The possible actions contemplated are different:

1. Visualisation of environmental measurements: the data of pollutants traced by continuous monitoring are displayed by the occupants in real time, through one of the options:
 - At least one display is positioned in an obvious position, at a height of $1.1\text{-}1.7\text{m}$ every 930 m^2 of regularly occupied space.
 - The requested data are displayed on a website or telephone application accessible to the occupants. At least one visible sign is placed every 930 m^2 of regularly occupied space, indicating how the data can be accessed.
2. Education about Air quality, adhering at least to two of the following requirements:
 - Supply to occupants of a collection of , digital or physical contents, including at least two resources that outline the impact of indoor air quality on human health (part of the collection of resources required by specification C01: Health and Wellness Awareness).
 - A labelling system (eg colours or symbols) is clearly displayed next to each screen related to air quality monitoring or on the relevant website. Information on health effects is shown in relation to a series of

concentrations of continuously monitored air pollutants. An explanation of the labelling system must be provided.

- Paper or digital communication, at least quarterly, which highlights the importance of indoor air quality for human health, including practical advice on how to improve indoor air quality.
- Training conducted by an air quality expert, which takes place at least once a year and covers aspects of health and well-being treated in the WELL Air concept, including the interpretation of the collected data and practical suggestions on how to improve the quality of the indoor air.

Note:

Information and documents must be adequate and appropriate to the level of literacy of the occupants. They can be presented in the form of training courses, brochures, videos, posters, newsletters and / or other written or online information.

If the requirements of "air quality education" are met through the provision of training materials, these can be counted in the specification C01: Awareness of health and well-being (Part 2: Promoting health and wellness education).

The training courses must provide an education appropriate to the cultural and literacy level. Training courses can be provided on-site, off-site or online; in groups or individuals; and through salespeople, on-site staff, health insurance plans or programs, community groups or other qualified professionals.

Verification

Annotated Document: Activity plan, Training material

Photos

The Nuvap ProSystem technology platform fully complies with the WELL certification requirements. The monitored data are displayed both through an App and through a Web interface. In both interfaces, the information is updated approximately 4 times per hour and presented in a simple way, with clear reference to the relevant thresholds.

Both in the app and via the web, there is a library that indicates for each pollutant the possible sources, the effects, the reference values and some behavioural solutions that can be implemented to reduce the presence of pollutants.

The same information, in a more detailed version, can be enclosed in a periodic report that Nuvap can process on request. Nuvap is available to do training on indoor pollution issues.

To further customise the experience of the occupants, it is possible to integrate the collected information into third parties portals, applications or dashboards, thanks to the complete set of APIs that Nuvap makes available.