



PRO2.2

Quality assurance of the construction

Objective

Our objective is to ensure that the requirements with regard to sustainability aspects from the planning stage are appropriately implemented through informative quality assurance processes during the construction phase and, based on this, provide documentation that these requirements have actually been fulfilled.

Benefits

If the quality of the building can be verified by means of appropriate investigations, this plays a key role in ensuring that the building can be used sustainably and for a long time to come. This provides the building owner with informative documentation on the quality of the commissioned work, and the user can be informed appropriately.

Contribution to overriding sustainability goals

No direct contribution to the Sustainable Development Goals (SDGs) of the United Nations (UN) and to the German Sustainability Strategy.



Outlook

Quality as one of the basic requirements for sustainable buildings will continue to be one of the central tenets of this system in this form. There are currently no plans to make any of the requirements in this criterion significantly stricter in the next few years.

Share of total score

				SHARE	WEIGHTING FACTOR
Office	Education	Residential	Hotel	1.6%	3
Consumer market	Shopping centre				
Department stores	Logistics				
Production					
Assembly buildings					



EVALUATION

Indicator 1 is used to give credit where quality assurance processes have been established in the building in the form of an overarching plan. Indicator 2 provides incentives to implement quality assurance processes, such as measurements for various sustainability issues. Measures that fall outside of the scope of the proposed topics can be credited as an alternative under the innovation area indicator. Indicator 3 gives credit for sites which implement strict quality assurance with regard to relevant characteristics of the construction products used. Indicator 4 is used to give credit for measures to prevent or reduce the risk of mould growing. A maximum of 60 points can be obtained for indicators 2.1 to 2.8 – that is to say, it is not necessary to carry out all the measurements in order to obtain the maximum possible number of evaluation points, but rather only those measurements that are relevant to the project. In this criterion, a maximum of 100 points can be awarded.

NO.	INDICATOR	POINTS
1	Quality assurance planning	
1.1	Quality assurance plan A quality assurance plan has been drawn up for the completed building, focussing on relevant measurements and specifying the people responsible for the tasks	10
2	Quality control measurements	
2.1	Implementation of quality control measurements	Max. 60
2.1.1	Differential pressure has been measured (using blower door test) before the implementation of the fitting work (EN ISO 9972 or DIN EN 13829 or equiv.)	+20
2.1.2	Thermal imaging measurement has been carried out for the building (EN 13187 or ISO 6781 or equiv.)	+10
2.1.3	Reverberation period has been measured for relevant, representative building components	+10
2.1.4	Sound reduction index (airborne sound insulation) pertaining to the attenuation of external noise ingress (e.g. by means of the façade) has been determined	+10
2.1.5	Sound reduction index (airborne sound insulation) pertaining to the attenuation of noise in the interior (e.g. by means of meeting-room walls) has been determined	+10
2.1.6	Measurements have been taken to determine the footfall noise level from ceilings	+10
2.1.7	Other measurements that are relevant to the building (e.g. immissions control measurement, smoke extraction tests, moisture measurement prior to laying floor coverings in order to prevent moisture damage, etc.) have been taken – and the associated zero-defect declaration has been submitted	+10



Re 2 **INNOVATION AREA**



As in 2

Explanation: Additional or alternative measurements or other quality assurance measures can be credited here if they provide documentation on the high quality of the building or its building components, and these are not required by law or by the authorities and are not common practice.

3 Quality assurance for construction products

3.1 Quality assurance for the construction products used

20

Site is managed based on the requirements lists drawn up for the construction products that are to be used based on criteria ENV1.2, ENV1.3 and SOC1.2 and

A continuous comparison between target material use and actual material used (as required) is conducted and site management has produced documentation to demonstrate this in the form of site inspection reports

4 Mould prevention

4.1 Mould prevention

10

A ventilation programme tailored for the building has been drawn up and implemented in order to ensure that the building components are sufficiently dry



SUSTAINABILITY REPORTING AND SYNERGIES

Sustainability reporting

The number of sustainability aspects for which quality assurance measurements have been taken is a good key performance indicator (KPI) to report. The results of moisture measurement or mould prevention measures can be used for reporting purposes in accordance with "Level(s) – Common EU framework of core environmental indicators" [T&D_02].

NO.	KEY PERFORMANCE INDICATORS (KPIs)	UNIT
KPI 1	Number of sustainability aspects for which quality assurance measurements have been taken	[number]
KPI 2	Mould prevention measures implemented; corresponds to Level(s) indicator 4.1 Mould inspection [T&D_02]	[Yes]
KPI 3	Checking and testing the quality of construction and installation corresponds to Level(s) Indicator 1.1 - L3.2. [T&D_02]	[Yes]

Synergies with DGNB system applications

- **DGNB BUILDING IN USE:** The results of the measurements can be used in criterion 9.1 from the scheme for buildings in use as a basis for reporting relevant key performance indicators.
- **DGNB INTERIORS:** The results for indicators 2.3 and 2.5 can be used in criterion SOC1.3 from the scheme for interiors.
- **DGNB DISTRICTS:** Information from this criterion can be used in criterion PRO1.8 from the schemes for urban districts and business districts.



APPENDIX A – DETAILED DESCRIPTION

I. Relevance

Particularly in light of the increasing complexity of projects and the many different parties involved in planning and, above all, implementing these projects, quality assurance measures are crucial. "Invisible" defects, in particular, which can have significant negative impacts on both the usage and the user of building, can only be detected by taking measurements. These defects must be rectified before the building comes into use.

Furthermore, the planned energy performance can only be achieved if the building envelope is of the appropriate imperviousness. This must also be measured and verified. This kind of measurement-based quality assurance must be planned early on and the associated responsibilities must be defined.

II. Additional explanation

In practice, one problem that is often encountered is that, despite high standards being applied, the work that is carried out still exhibits certain defects. This is why it is advisable to conduct comprehensive quality controls on the building.

Measuring for quality control purposes plays a key role in allowing the target values set at the planning stage to be verified to establish whether they have been achieved, as well as allow this to be documented.

III. Method

Indicator 1: Quality assurance planning

- A quality assurance plan must be drawn up for the completed building, focusing on relevant measurements and on specifying the people responsible for the tasks

Indicator 2: Quality control measurements

- Measurements must be taken and the results evaluated and compared with the requirements by suitably qualified test bodies or experts
- The scope of the measurements taken should be proportional to the size of the building and should adequately reflect the objective of verifying the building's quality.

Indicator 3: Quality assurance for construction products

- Site management must be instructed based on the requirements lists drawn up for the construction products that are to be used based on the criteria ENV1.2, ENV1.3 and SOC2.1
- A continuous comparison between target material use and actual material used (as required) must be conducted and the site management must produce documentation in the form of site inspection reports to verify this



Indicator 4: Mould prevention

- A ventilation programme tailored to the building situation has been drawn up and implemented in order to ensure that the building components are sufficiently dry



APPENDIX B – DOCUMENTATION

I. Required documentation

The following list depicts the possible forms of documentation. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements.

Indicator 1: Quality assurance planning

- The quality assurance plan must be submitted – including a schedule for the measurements and a definition of the responsibilities

Indicator 2: Quality control measurements

- Each indicator must be submitted using DGNB's template for confirmation from the test body or expert that the measurements have been taken and that the relevant requirements have been fulfilled. Improvements or repair work may be necessary in order to fulfil the requirements; the effectiveness of this work must then be verified by means of corresponding measurements. There is no need to submit measurement results, measurement logs, any intermediate measurements, etc. to the DGNB certification body

Indicator 3: Quality assurance for the construction products used

- Documentation must be submitted to demonstrate that the site management has been instructed in how to use and implement the requirements lists that have been drawn up for the construction products that are to be used
- Documentation must be submitted to demonstrate that the site management has conducted continuous comparisons between target material used and actual material used with the requirements lists, along with documentation of the results by the site management in the form of site inspection reports

Indicator 4: Mould prevention

- Documentation must be submitted to demonstrate that a ventilation programme tailored to the context of the building has been implemented to ensure that the relevant building components are sufficiently dry



APPENDIX C – LITERATURE

I. Version

Change log based on version 2018

PAGE	EXPLANATION	DATE
626	General: scheme “assembly buildings” has been added	16.09.2021
627	Indicator 2: Reference standards for checking and testing completed	16.09.2021
629	Sustainability reporting: KPI 3 on EU taxonomy compliance has been added	16.09.2021

II. Literature

- ISO 9972:2015, Thermal performance of buildings — Determination of air permeability of buildings — Fan pressurization method;
- DIN EN 13829:2001-02, Thermal performance of buildings - Determination of air permeability of buildings;
- EN 13187:1999, Thermal performance of buildings. Qualitative detection of thermal irregularities in building envelopes. Infrared method;
- ISO 6781-3:2015, Performance of buildings — Detection of heat, air and moisture irregularities in buildings by infrared methods