

Health Score 0.9

A Practical Framework for Healthy Buildings

By Klaus Dosch, ResScore GmbH

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1. Why do we need a Health Score?

The requirements for sustainable construction are becoming increasingly complex. Well-known assessment systems for sustainability in construction include countless indicators from the three pillars of sustainability (economic, social and ecological). This makes the rating systems complex and, above all, costly. The multitude of other indicators tends to dilute the potential insights that the rating systems can provide in terms of health aspects and building user satisfaction, as well as the key ecological challenges of decarbonisation, energy system transformation and raw material transition (i.e. construction transition).

The Health Score aims to reflect health and well-being aspects as pragmatically as possible and in a way that focuses on the essentials. At the same time, the score should be applicable in an early planning phase. In early planning phases, there is still room for making decisions with regard to construction and materials. In later phases (detailed planning or execution planning), planning changes can often only be realised with great effort. In practice, they are therefore mostly ignored.

The Health Score picks up on the philosophy of the resource score, which pragmatically but essentially focuses on evaluating the aspects of the building transition (energy transition, decarbonisation and raw material transition) but deliberately leaves out the other aspects of ecological sustainability and the other two pillars of sustainability (economic and social).

The Health Score and resource score therefore form a composite score that assesses the most important sustainability criteria with a manageable amount of effort and communicates them in a clear and comprehensible way.

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2. How the Health Score works

The Health Score distinguishes between parameters that can have a negative impact on the health of people in buildings and those that relate to well-being. The boundaries between health in the sense of the absence of illness and well-being are blurred, and definitional attempts to draw a distinction do not lead to a uniform demarcation.

The Health Score will therefore only consider a few parameters that represent evidence-based health risks as relevant to health. Vulnerable groups of people must always be considered, for example people with pre-existing conditions, the elderly or particularly young people.

The Health Score is developed for three building types:

- Residential buildings
- Office buildings
- School buildings (educational buildings, kindergartens, ...)

All parameters should already be addressable in the planning phase of buildings. Once the building has been planned, it should be possible to determine with some certainty the Health Score achieved later during building operation.

At the same time, emphasis is placed on a pragmatic approach. It should be possible to determine a Health Score with manageable effort.

The Health Score takes into account the ambient air of the building being analysed. The quality of the indoor air is initially dependent on the quality of the outdoor air, as this is supplied to the building as fresh air.

Firstly, the parameters relevant to health are assessed. Five parameters were identified as such:

- Interior temperature
- Radon exposure
- Particulate matter of the PM fraction 2,5
- Nitrogen dioxide
- VOC
- Formaldehyde

For each of the parameters, limits or procedures were defined that avoid a health hazard with sufficient probability, even for vulnerable people. If one parameter in one of the five categories is not achieved, the building is given a score of "E" at best. If two parameters are not achieved, the building receives a score of "F" at best. If three or more parameters are not achieved, the building must be given a score of "G", the worst score. Further consideration of

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the parameters for wellbeing is therefore unnecessary, as it is not possible to improve the building's classification in the Health Score even if the parameters for wellbeing are rated as best.

Figure 1: If all of the health parameters are achieved, the building starts with a score of D.



The Health Score is carried out at two points in a building's life: an indication of the score that the building can achieve is possible in an early planning phase. After the building is completed, a review is carried out to determine whether the criteria have actually been met. This is particularly relevant for emission parameters such as VOC and formaldehyde. In addition, certain installations must be verified that are important for indoor air quality and other parameters. The Health Score for the building is only determined after a successful inspection. Therefore, it is mandatory to measure the indoor air quality in relation to the relevant parameters after the indoor air measurement according to DIN ISO 16000-3.

3. Necessary preparatory work

In order to determine the Health Score, some preparatory work must be carried out in advance. This concerns the location of the building.

3.1 Determination of the ODA value (outdoor air)

The quality of the indoor air is largely determined by the outdoor air. The poorer the quality of the outdoor air, the greater the demands on the treatment of the air entering the building in order to achieve high-quality indoor air that is not harmful to health.
The quality of the outside air is described using the ODA value:

- ODA 1: clean air that may only be occasionally contaminated with dust (e.g. pollen)
- ODA 2: Outdoor air with a high concentration of dust or fine dust and/or gaseous pollutants
- ODA 3: Outdoor air with a very high concentration of dust or fine dust and/or gaseous pollutants

Depending on the ODA value at the location of the building, different measures are required for high-quality indoor air.
The ODA value must be determined for non-residential buildings. For smaller residential buildings, this can be determined as described in Chapter 3.1.3.2 can be estimated.

3.2 Determination of radon levels in soil air

To determine the hazard potential at the building site or within the building, it is necessary to determine the radon contamination of the soil air. Initial information can be found, for example, in the Radon Atlas of the Federal Office for Radiation Protection, which is available for Germany.[1]

[1] https://www.imis.bfs.de/geoportal/, accessed on 4 October 2024

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4. Consideration of health and well-being

4.1 Health

Criteria for the consideration of health are only applied if they are based on reliable evidence. Depending on the type of building, the following criteria are analysed to assess whether the building poses a health risk:

Table 1: Relevance of the selected parameters for the assessment of health concerns for different building types

Parameters	Residential building	Office buildings	School buildings
Temperature	X		
Radon	X	X	X
Particulate matter $PM_{2,5}$	X	X	X
Nitrogen Dioxide NO_2	X	X	X
VOC	X	X	X
Formaldehyde	X	X	X

Note: Given that formaldehyde is a prevalent and hazardous VOC, it is often used as an indicator for indoor air quality assessments. Monitoring formaldehyde levels can provide valuable insights into potential health risks. However, focusing solely on formaldehyde may overlook other harmful VOCs present in the indoor environment. Therefore, a comprehensive assessment that includes both formaldehyde and a broader spectrum of VOCs is recommended to accurately evaluate the health risks associated with indoor air quality.

4.1.1 Interior temperature

The risk of unhealthy heat stress arises primarily in sunny weather phases that are accompanied by high temperatures and weak winds or calm or during heat waves. The harmfulness to health of the room temperature depends on three parameters in particular:

- Vulnerability of the persons
- Absolute upper and lower limits
- Air movement to enable the body's own cooling through evaporation of sweat

In special environments such as production halls, extreme temperatures cannot always be avoided. Adapted and in some cases actively heated or cooled clothing in particular helps room users to work in a temperature range that is safe for them.
However, the Health Score does not consider production environments.

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Particularly thermally insulated or actively heated clothing can therefore be excluded from the residential buildings, office buildings and schools analysed. Temperature ranges for these buildings that are proven to be hazardous to health should be orientated towards particularly vulnerable groups of people.

During the summer season, the Robert Koch Institute (RKI) calculates the probable heat-related excess mortality on a weekly basis. In its latest report for 2024 dated 2 October 2024, the RKI estimates a number of heat-related deaths of 3,000 people for the summer season.[2] Vulnerability increases with the age of heat-exposed people.

Table 2: Estimated number of heat-related deaths in Germany according to RKI, 2024

Age group	Estimated number of heat-related deaths; ø; [95% confidence interval]	Heat-related deaths per 100,000, based on ø
< 65	130 [-480; 650]	0,2
65-74	290 [-330; 930]	2,8
74-84	760 [-90; 1.250]	11,9
> 85	1.810 [860; 2.820]	62,7
Total	3.000 [1.500; 4.400]	3,5

The number of deaths is an absolute figure without reference to the population distribution. The number of deaths per 100,000 people in the relevant age group is therefore more meaningful. This shows that the number of heat-related deaths in the under-65 age group is only 0.2 per 100,000, which is 17.5 times lower than the average. The age group of 65- to 74-year-olds is 2.8 per 100,000 (approx. 80% of the average), while the age group of 75–84-year-olds already has 3.4 times the number of heat-related deaths at 11.0 per 100,000. In the population group of at least 85-year-olds, the number of heat-related deaths is 62.7 per 100,000, which is 18 times higher than the average.

From these figures it can be deduced that the population group under 65 years of age has only a low risk of heat-related death.

4.1.1.1 Office and school buildings

As people aged 65 and over are only sporadically found in schools and office buildings, it is suggested that the indoor temperature criterion should not be considered from a health perspective for the Health Score in administrative and school buildings.

In addition to this, the Workplace Regulations in Germany define a maximum temperature of 35°C at the workplace. Rooms with temperatures above 35°C must not be used. The topic remains relevant for residential buildings.

[2] RKI, 2024: an der Heiden M, Zacher B, RKI Office for Climate Change & Health, Diercke M, Bremer V: Weekly report on heat-related mortality week 38/2024 from 03 October 2024; Robert Koch Institute | DOI: 10.25646/12861

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4.1.1.2 Residential buildings

DIN 4108-2, as amended in February 2013, applies to new buildings in Germany with regard to protection against heat in summer. It regulates a minimum level of thermal insulation in summer, which is prescribed for every new building depending on its location in relation to summer climate regions.

For Germany the DIN distinguishes between summer climate regions A, B and C. Region A can be roughly described as a low mountain range or mountainous region or as a coastal region of the North Sea and Baltic Sea. Particularly warm areas are included in region C. These include the Upper Rhine Valley, the Lake Constance region, the Rhine-Neckar and Rhine-Main regions, the Moselle and Middle Rhine valleys, the Ruhr area and the Leipzig/Halle and Dresden city regions. All other regions are summarised in Region B.

The Netherlands should be categorised as Region A and the other regions as Region B due to its climate, which is significantly more influenced by the North Sea in the coastal regions.

The DIN requires the following reference values for the indoor temperature in the least favourable room in terms of summer heat protection. Excess degree hours are also specified, which indicate how many hours per year the reference values may be exceeded by how many degrees.

Table 3: Reference values for the indoor temperature for residential buildings per summer climate region and maximum tolerated excess degree hours, DIN 4108-2, February 2013.

Summer climate region	**Indoor temperature reference value**	**Maximum excess degree hours [Kh/a]**
	[°C]	Residential buildings
A	25	1.200
B	26	
C	27	

If the reference values for residential buildings, including the defined maximum deviations of DIN 4108-2, are not complied with, the building is categorised as unhealthy in the Health Score. Irrespective of its other qualities, the building is rated "E" at best.

4.1.2 Radon

Radon is a radioactive noble gas. With a density of 9.73 kg/m3, it is more than seven times denser than normal air. This means that radon tends to accumulate in poorly ventilated rooms, especially basements.

Radon is continuously produced from the decay of uranium in the soil. The radon content in the soil air therefore depends on the geology of the location. The Federal Office for Radiation

Protection has produced a radon exposure map for soil gas[3] . The map is divided into seven radon exposure classes.

Table 4: Exposure classes for radon in soil air, Federal Office for Radiation Protection, status 2021

Class	Radon exposure [Bq/m]³
1	> 150.000
2	100.000 - 150.000
3	80.000 - 99.999
4	60.000 - 79.000
5	40.000 - 59.999
6	20.000 - 39.000
7	< 20.000

Radon is a short-lived isotope with a half-life of only approx. 92 hours. Only a constant influx from the soil air in conjunction with poor ventilation of rooms can therefore lead to radon levels that are significantly higher than the background level.

Since 2021, the federal states of Germany have identified and announced areas with increased radon exposure. In these areas, there is a risk that a reference value of 300 Bq/m3 air will be exceeded in a "significant number of buildings with habitable rooms or workplaces".[4]

In most areas of the Netherlands, radon levels in soil air are expected to be significantly lower than in many areas of Germany due to the fundamentally different geology.[5] In 1998, for example, the RIVM carried out an investigation into the radon content of indoor air in various buildings with different ventilation strategies.[6] According to this study, the radon levels in indoor air, even in airtight buildings with a low air exchange rate, remain far below the reference value of 300 Bq/m3 as the average annual concentration of radon in indoor air, measured using radioactive decay per second, at a maximum of 80 Bq/m3.

[3] https://www.bfs.de/SharedDocs/Bilder/BfS/DE/ion/umwelt/radon-karte-boden.jpg; accessed on 2 October 2024

[4] Cf. § 121 (1) StrlSchG in conjunction with § 124 StrlSchG. § 124 StrlSchG.

[5] European Environment Agency: European Indoor Radon Map, December 2011, https://www.eea.europa.eu/en/analysis/maps-and-charts/european-indoor-radon-map-december-2011, accessed 2.10.24.

[6] RIVM, 1998: Rijksinstituut voor Volksgesondheid en Milieu, RIVM Report no. 610050 005, Modelling radon transport in Dutch dwellings, 1998

4.1.2.1 Effects on the Health Score

Firstly, the expected radon exposure in the soil air and a possible location within a radon precautionary area must be checked for the building site. The Federal Office for Radiation Protection provides a geoportal in which radiation data for Germany can be called up with a resolution of 1 km x 1 km.[7]

With the help of this geoportal, it can be determined:

- Radon concentration in the soil air for categorisation as low, medium or high exposure potential
- Location in a radon precautionary area

No measures are required in areas with a low exposure potential (< 40,000 Bq in soil gas). The radon exposure health criterion does not apply.

In areas with a medium exposure potential (40,000 - 79,999 Bq in the soil air), structural precautions must be taken to ensure that the building does not pose a health risk.

- Sealing of supply and disposal pipe penetrations through the floor slab or basement floor
- Sealing or avoiding joints between wall and floor slab or basement floor
- Sealing or prevention of cracks in the floor slab or basement floor. Suitable gas-tight sealing measures must be taken for basement floors without a concrete floor slab.

In areas with a high exposure potential (> 80,000 Bq in the soil air) or a radon precautionary area designated by the German federal states, the structural measures for areas with a medium exposure potential must be taken. In addition, a measurement must prove that the indoor exposure to radon is permanently below the reference value of 300 Bq/m3 indoor air.

Buildings that are located in areas with medium or high exposure potential can only be harmless to health if they have taken the listed structural measures and, in the case of high exposure potential, have additionally carried out an indoor air measurement, the result of which is an average annual exposure below 300 Bq/m3 indoor air.

Buildings in areas with medium or high exposure potential that do not fulfil these requirements are potentially hazardous to health and are therefore classified at best in class "E" of the score.

The Federal Office for Radiation Protection published comprehensive documentation on radon and associated exposure prevention strategies in 2019.[8]

[7] https://www.imis.bfs.de/geoportal/, accessed on 4 October 2024
[8] https://www.bfs.de/SharedDocs/Downloads/BfS/DE/broschueren/ion/radon-handbuch.pdf?__blob=publicationFile&v=14; retrieved on 4.10.24

4.1.3 Outdoor air quality and supply air

4.1.3.1 Non-residential buildings

According to DIN EN 16798-3, the quality of the outside air must be taken into account when designing a ventilation or air conditioning system in non-residential buildings. The quality of the outside air is divided into three classes:

Table 5: Classification of outside air (ODA), DIN EN 16798-3

Category	Description of the
ODA 1	Outside air that may only be occasionally contaminated with dust (e.g. pollen). Is achieved if the guidelines of the World Health Organisation WHO, 2005 and all national standards or regulations on outdoor air quality are complied with.
ODA 2	Outdoor air with a high concentration of dust or fine dust and/or gaseous impurities. Is achieved if the contamination exceeds the WHO guidelines or national standards or regulations for outdoor air quality by a factor of up to 1.5.
ODA 3	Outside air with a very high concentration of gaseous impurities and/or dust or fine dust. Is achieved when the pollution exceeds the WHO guidelines or national standards or regulations for outdoor air quality by more than a factor of 1.5. Outdoor air of category ODA 3 is often found in highly industrialised areas, airports or near busy roads or traffic junctions.

The classification of outdoor air must be carried out separately for gaseous and particulate ODA pollutants. The following substances must be measured:

- Carbon monoxide (C0)
- Sulphur dioxide (SO_2)
- Nitrogen oxides (NO_x)
- Volatile organic compounds (VOC)
- $PM_{2,5}$

The effort that may be required to clean the outside air depends on the desired quality level of the air flow entering a room equipped with an air conditioning or ventilation system.

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Table 6: Classification of supply air according to quality improvement, DIN EN 16798-3, Annex B4.3

Category	Description of the
SUP 1	Applies if the supply air complies with the limit values of the WHO guidelines, 2005 and all national standards or regulations on air quality with a factor of 0.25.
SUP 2	Applies if the supply air complies with the limit values of the WHO guidelines, 2005 and all national standards or regulations on air quality with a factor of 0.5.
SUP 3	Applies if the supply air complies with the limit values of the WHO guidelines, 2005 and all national standards or regulations on air quality with a factor of 0.75.
SUP 4	Applies if the supply air complies with the limit values of the WHO guidelines, 2005 and all national standards or regulations on air quality with a factor of 1.
SUP 5	Applies if the supply air complies with the limit values of the WHO guidelines, 2005 and all national standards or regulations on air quality with a factor of 1.5.

4.1.3.2 Residential building

As DIN EN 16798-3 only applies to non-residential buildings, but the consideration of outdoor air is essential for the quality of indoor air, the following procedure is proposed for determining the quality of outdoor air:

Determination of the ODA values, as prescribed in DIN EN 16798-3 for non-residential buildings. This should be carried out in particular for larger multi-family residential buildings.

Alternatively, the ODA values can be estimated based on the location of the building.

Table 7: Estimation of the ODA value for outdoor air quality for residential buildings based on the location of the building in relation to potential sources of air pollution

Category	Description of the
ODA 1	Outside air that may only be occasionally contaminated with dust (e.g. pollen). Is achieved if ALL of the following criteria apply: • Distance to busy roads > 100 m • Distance to undeveloped meadow, forest or car park areas < 200 m • Distance to industry with high air pollution potential > 2 km • Distance to intensive agriculture (factory farming) > 2 km
ODA 2	Outdoor air with a high concentration of dust or fine dust and/or gaseous impurities. Is achieved by all areas that cannot be categorised as ODA 1 or ODA 3.

ODA 3	Outside air with a very high concentration of gaseous impurities and/or dust or fine dust. Is accepted if one of the following criteria applies: - Distance < 1km to an industrial area with an area > 50 ha - Distance < 1 km to intensive agriculture (factory farming) - Located directly on busy city centre roads or country roads - Distance to motorways or motorway-like roads < 100 m

4.1.4 Particulate matter

Fine dust PM10 is a dust with a particle size smaller than 10 µm (1/100 mm). A subgroup of PM10 is PM2,5. Its particle size is smaller than 2.5 µm. PM10 can penetrate the nasal cavity in humans, while PM2,5 can penetrate the bronchi and alveoli.

Particulate matter is mostly anthropogenic. Traffic is a significant source. Here, combustion engines, especially diesel engines, produce particulate matter. Added to this is tyre and brake abrasion. But particulate matter is also emitted by biomass heating systems such as fireplaces or stoves.

Other sources are agriculture. In windy and dry weather phases, soils containing clay or loess can be sources of particulate matter. Ammonia emissions from livestock farming also contribute to secondary particulate matter formation.[9]

4.1.4.1 Particulate matter PM_{10}

There are currently no clear indications of health hazards for PM10 . Therefore, particulate matter PM10 is not considered further in terms of health hazards.

4.1.4.2 Particulate matter $PM_{2,5}$

The WHO specifies a maximum annual average of 5 µg/m3 air for long-term exposure to PM2,5 . A maximum daily average of 15 µg/m3 may only be exceeded on up to 4 days per year. [10]

The SUP4 supply air quality complies with the maximum concentrations of PM defined by the WHO2,5 . DIN EN 16798-3 requires a minimum degree of separation for particulate matter depending on the outdoor air quality (ODA):

- Air filtration is not required in areas with ODA 1.
- In areas with ODA 2, at least 60 % of the particulate matter PM2,5 must be captured.
- In areas with ODA 3, at least 80 % of the particulate matter PM2,5 must be captured.

[9] UBA, 2009: Background paper on particulate matter pollution in Germany, Dessau, 2009.
[10] WHO, 2021: WHO global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide. Geneva: World Health Organization; 2021 Licence: CC BY NC SA 3.0 IGO.

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If air filtration is required, instructions for cleaning or filter replacement must be communicated to the building users or measures must be taken to automatically report the filter status to a suitable maintenance company in order to arrange for maintenance or replacement.

Buildings in the ODA 2 and ODA 3 areas that do not achieve the required minimum separation rate for particulate matter PM2,5 are considered to be of health concern and are categorised as "E" at best, regardless of their other quality.

4.1.5 Nitrogen dioxide NO_2

Nitrogen dioxide is an irritant gas. It is produced spontaneously from oxygen and nitrogen as well as during natural processes such as lightning strikes or during technical combustion processes in combustion engines or heating systems.

Exposure to nitrogen dioxide increases the risk of illness or death, particularly in vulnerable population groups. It can also lead to problematic health reactions such as irritant effects in the human body. [11]

The WHO specifies a limit value of 25 µg/m3 for the 24-hour average. WHO, 2021 considers 50 µg/m3 to be an acceptable interim value. WHO, 2021 specifies a limit value of 10 µg/m3 as an annual average. An interim value of 20 µg/m3 is specified.

The background pollution in rural areas is assumed to be around 10 µg/m3 for NO2 . In inner-city areas, a background level of 20 µg/m3 is given. Higher values can be assumed in the vicinity of busy roads or larger sources of combustion exhaust gases from other sources.

For the Health Score, a correlation is drawn between the ODA values and the WHO threshold values. ODA 1 areas are characterised by rural areas or are very close to green zones with a simultaneous absence of traffic- or industry-related emissions. It can therefore be assumed that the WHO limit value of 10 µg/m3 is essentially complied with in these areas.

ODA 2 areas are likely to be mostly in inner-city areas outside the direct influence of busy roads and industrial emissions. The background pollution to be found there is in the range of the WHO interim value of 20 µg/m3.

For this reason, nitrogen dioxide in residential and administrative buildings and schools in ODA 1 and ODA 2 areas is no longer pursued as a criterion.

In ODA 3 areas, air purification must be carried out for residential and administrative buildings and schools, as a result of which the supply air must at least comply with the WHO interim value of 20 µg/m3.

[11] WHO, 2021, ibid.

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Buildings in ODA 3 areas that cannot guarantee the WHO interim value of 20 µg/m3 in the supply air are potentially hazardous to health, at least for vulnerable groups of people, and are classified as "E" at best, regardless of their other quality.

4.1.6 VOC

VOCs (Volatile Organic Compounds) are volatile organic compounds. A distinction is made between non-carcinogenic and carcinogenic VOCs.

DIN EN 16516 contains a list of non-carcinogenic VOCs in Annex G; carcinogenic VOCs are listed in Annex H of the same standard.

Sources of VOCs in the outdoor air include biological processes such as decomposition or decay processes or technical processes such as incomplete combustion of fuels. Other sources of VOCs in outdoor air can be emissions from industrial and commercial operations. However, the concentrations of VOCs in the outdoor air are generally lower, so ventilation helps to reduce any VOC concentrations in the indoor air [12] . VOC sources in indoor air include paints and varnishes, plastics, cleaning agents, wall and ceiling materials, flooring materials and tobacco smoke.

An ad hoc working group of the Federal Ministry of Health has developed reference and guideline values for indoor exposure to VOCs[13]:

Level 1. TVOC values below 0.3 mg/m3 are hygienically safe, provided that no guide values for individual substances are exceeded. They are referred to as the "target value" (hygienic precautionary range) and are to be reached or, if possible, fallen below with a sufficient time interval after new construction or renovation measures in rooms.

Level 2. TVOC values between > 0.3 and 1 mg/m3 can be categorised as hygienically safe, provided no guideline values are exceeded. This concentration range indicates, for example, solvent inputs that have not yet been fully aerated and indicates the need for increased ventilation.

Level 3. TVOC values between > 1 and 3 mg/m3 are to be assessed as hygienically conspicuous and apply for a limited period (< 12 months) as the upper limit for rooms intended for longer-term occupancy. In normally used residential, school or office rooms without recent renovation.

[12] https://www.umweltbundesamt.de/themen/gesundheit/umwelteinfluesse-auf-den-menschen/chemische-stoffe/fluechtige-organische-verbindungen#fluchtige-organische-verbindungen-voc-; accessed on 11/10/2024

[13] Ad hoc AG, 2007: Ad hoc AG. Assessment of indoor air contamination using reference and guideline values, 2007. Bundesgesundheitsblatt 50, 990-1005.

Level 4: Rooms with TVOC values between > 3 and 10 mg/m3 are considered to be hygienically unsafe and, if no alternatives are available, should only be used for a limited period of time (maximum one month) and with increased regular ventilation measures.

Level 5. TVOC values between > 10 and 25 mg/m3 are classified as hygienically unacceptable. As a rule, the use of the room should be avoided; at most, a temporary daily stay (by the hour) and the implementation of increased regular ventilation measures is reasonable.

At values > 25 mg/m3, utilisation should be avoided.

A TVOC value of less than 0.3 mg/m3 is the target for all common rooms in residential and administrative buildings and schools. As higher concentrations of TVOC can occur in new buildings or after renovation work for a limited period of time, this parameter cannot be reliably determined or approximated when planning buildings.

A concept for compliance with level 1 of the TVOC load in indoor air is a prerequisite for the Health Score for a building that is harmless to health. The target value must be confirmed by measurement after one year. All relevant materials that are brought into the building must be included in this concept.

The type of concept for achieving level 1 is intentionally left open. It is not prescribed whether the goal is achieved by technical devices or by the selection of materials.

Buildings for which no concept for compliance with the level 1 TVOC guideline value has been developed and taken into account in the planning are considered to be potentially hazardous to health, at least for vulnerable groups of people, and are classified as "E" at best, regardless of their other quality.

4.1.7 Formaldehyde

Formaldehyde is a gaseous hydrocarbon and is therefore contained in TVOCs. Formaldehyde is harmful to health in indoor air because it is a toxic and irritating gas that can have negative effects on health even in low concentrations. In particular, it has an irritant effect on mucous membranes and can cause allergic reactions. Formaldehyde has also been classified as a proven carcinogen.

Sources of formaldehyde exposure indoors are usually furniture and chipboard that have been manufactured using formaldehyde-based resins. These resins are also used in carpets, adhesives and paints.

In Germany, a guideline value RW1 for indoor air of 100 µg/m3 applies, although it is not undisputed whether this is a guideline value for long-term exposure. The guideline value for long-term exposure is 60 µg/m3 in Austria and only 10 µg/m3 in France. The WHO has only set a guideline value for short-term exposure of 30 minutes, which is 100 µg/m3.

The limit value for the Health Score is therefore set at 60 µg/m3 of indoor air.

As with TVOC in Section 4.1.6, compliance with this limit value must be guaranteed by means of a suitable concept, the effectiveness of which is validated after completion of the building.

Buildings for which no concept for complying with the formaldehyde limit value of 60 µg/m3 of indoor air has been developed and taken into account during the planning phase are considered to be potentially harmful to the health of vulnerable groups of people at the least and, regardless of their other qualities, are at best classified as 'E'.

4.1.8 Wellbeing

Criteria for ensuring well-being are divided into measurable criteria and non-measurable criteria. DIN EN 16798-1 is used for measurable criteria. This standard defines four categories for mechanically heated and cooled buildings, which relate to a predicted percentage of dissatisfied users.

The categories of indoor air quality do not reflect the air quality in the room. Rather, they categorise the proportion of users dissatisfied with the air quality. The categories are therefore subjective and their reference values are not to be understood as limit values.

Category II is the target for general building use. It may only make sense to achieve Category I for particularly vulnerable people, such as the elderly. Category II is therefore regarded as the maximum achievable for school and administrative buildings; the values for Category I are ignored. Category I is retained for residential buildings. Achieving this category also takes into account vulnerable people as residents.

Table 8: Categories of indoor air quality with predicted percentage of dissatisfied users, according to DIN EN 16798-1.

Indoor air quality category	Predicted percentage of dissatisfied customers
I	< 6 %
II	≥ 6 %; < 10 %
III	≥ 10 %, < 15 %
IV	≥ 15 %; < 25 %

These categories for indoor air quality are used for different parameters.

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4.2 Measurable criteria

4.2.1 Quantitatively measurable criteria

4.2.1.1 Distinction between residential and administrative & school buildings

A distinction is made between residential buildings on the one hand and administrative and school buildings on the other.

Residential Buildings

The temperature values and the predicted satisfaction ranges are taken from DIN EN 16798-1. The line highlighted in bold (Category II) is recommended as a guide value for the design of the building. For the logic of the Health Score 0.9, achieving Category II is considered a fulfilled criterion. Over-fulfilment in Category I is assessed with 1.5 times the number of points. Category III leads to a deduction of 0.5 points; Category IV to a deduction of 1.5 points.

Table 9: according to DIN EN 16798-1, Tables NA.2 and NA.3 for residential buildings, living rooms (bedrooms, living rooms, etc.).

Category	Predicted percentage of dissatisfied [%]	Minimum value for heating (winter period)	Maximum value for cooling (summer period)
I	< 6	21,0	25,5
II	**< 10**	**20,0**	**26,0**
III	< 15	18,0	27,0
IV	< 25	16,0	28,0

Table 10: according to DIN EN 16798-1, Tables NA.2 and NA.3 for residential buildings, other rooms (kitchens, storage rooms, etc.).

Category	Predicted percentage of dissatisfied [%]	Minimum value for heating (winter period)	Maximum value for cooling (summer period)
I	< 6	18,0	Not defined
II	**< 10**	**16,0**	**Not defined**
III	< 15	14,0	Not defined
IV	< 25	Not defined	Not defined

Office and school buildings

The temperature values and the predicted satisfaction ranges are taken from DIN EN 16798-1. The line highlighted in bold (Category II) is recommended as a guide value for the design of the building. For the logic of the Health Score 0.9, achieving Category II is considered a fulfilled criterion and is given a single score. Over-fulfilment in Category I is not assessed. Category III leads to a deduction of 0.5 points; category IV to a deduction of 1.5 points.

Table 11: according to DIN EN 16798-1, Tables NA.2 and NA.3 for offices and similarly used rooms (individual and open-plan offices, conference rooms, lecture and auditoriums, cafeterias, restaurants, classrooms)

Category	Predicted percentage of dissatisfied [%]	Minimum value for heating (winter period)	Maximum value for cooling (summer period)
I	< 6	21,0	25,5
II	**< 10**	**20,0**	**26,0**
III	< 15	19,0	27,0
IV	< 25	18,0	28,0

For the temperature intervals, maximum deviations of +/- 2°C (K) are permitted in a maximum of 5% of the utilisation time. Category I or II can no longer be achieved in the event of greater deviations in both the temperature interval and the duration of the deviation. Depending on the deviation, the building is then categorised as Category III or IV. If deviations occur in a building classified in category III, it is downgraded to category IV.

4.2.1.2 Temperature and other parameters can be influenced by the user

The criterion applies to all buildings.

The lack of effective control over indoor conditions leads to dissatisfaction.[14] Control options should generally relate to the ability to operate sun shading, temperature, lighting and ventilation. It may also include the ability to effectively influence an automatic control system. It should also be possible to open windows.

The possibility of influencing indoor conditions promotes well-being. The following influencing options are rated positively:

- Temperature
- Illuminance
- Lighting quality (light colour, e.g. cold, neutral, warm)
- Ventilation
- Window opening option

[14] Sujanova et al, 2019: Šujanová, P.; Rychtáriková, M.; Sotto Mayor, T.; Hyder, A. A Healthy, Energy-Efficient and Comfortable Indoor Environment, a Review. Energies 2019, 12, 1414. https://doi.org/10.3390/en12081414.

4.2.1.3 Carbon dioxide

The carbon dioxide content in indoor air comes from two sources: Outdoor air and indoor sources, e.g. humans.

The CO2 content in the outdoor air in 2023 was 424,6 ppm on average; the concentration is currently increasing by 2 to 3 ppm per year. For the evaluation of indoor CO2 levels, the outdoor CO2 concentration should be considered. For indoor spaces, the breathing of people is the main source of CO2. Emissions from candles or cigarettes are not taken into account below.

CO2 is also a good indicator of the subjectively perceived quality of indoor air. This is significantly influenced by the users' bio-effluents. DIN EN 16798-1 refers to "unadapted persons" to characterise persons with bio-effluents that may be perceived as disturbing. The closer the CO2 value of the indoor air is to the CO2 content of the outdoor air, the higher the air exchange rate in a room with constant occupancy. In the planning phase of buildings, however, the anticipated CO2 content of the indoor air can only be determined by deduction using the air exchange rate.

When planning buildings, however, it should be easier to ensure the air quality by taking into account the planned occupancy of people through sufficient dimensioning of the air exchange rate per person.

Table 12: Design outdoor air volume flow for unadapted persons for dilution of human emissions (biological vapours) for different categories, DIN EN 16798-1.

Category	Predicted percentage of dissatisfied customers	Outdoor air volume flow per unadapted person l/s per person
I	15	10
II	20	7
III	30	4
IV	40	2,5

Table 13: Standard design values for CO2 concentrations above the concentration in the outside air and including the concentration in the outside air from 2023, according to DIN EN 16798-1

Category	Corresponding CO_2 concentration above the outdoor air concentration in ppm / including 420 ppm in the outdoor air
I	350/770
II	550/970
III	900/1320
IV	1350/1770

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If the outside air has a CO2 content that is significantly higher than the atmospheric annual mean value, the concentration including the concentration of the outside air must be used in the design.

4.2.1.4 Daylight and sunlight

This criterion applies to all rooms that are regularly used by people over a longer period of time but does not include rooms in which daylight lighting prevents the room from being used.

DIN EN 17037 formulates minimum recommendations in order to achieve a sufficient subjective impression of brightness with daylight and to establish a sufficient line of sight to the outside.

There is evidence of a correlation between the availability of daylight and job satisfaction. More than 90% of office workers prefer to work in daylight rather than artificial light. Users who work near a window are more satisfied than their colleagues who sit further away from the window.[15]

Residential building

DIN EN 17037 recommends minimum levels of sunlight exposure for at least one room in a dwelling.

Daylight openings with a sunlight duration of more than 3 hours in the period between 21 March and 21 September of a year must be equipped with a suitable shading device that prevents overheating and glare but allows daylight to enter and visual contact with the surroundings.

Calculating daylight factors requires complex repetition of calculations and thus is generally undertaken often using a complex software product.

Since 2019, DIN EN 17034 (2022-05) has regulated recommendations for the supply of daylight in buildings. In Germany, there are also the mandatory provisions of the various state building codes of the individual federal states.

DIN EN 17034 specifies the following criteria for well-being:
- daylight supply with illuminance (A2)
- view (A3)
- duration of sunlight (A4)
- protection from glare (A5)

[15] Schakib-Ekbatan, Karin, 2015: Bürogebäude auf dem Prüfstand: Zur Zufriedenheit mit Raumklima und Raum am Arbeitsplatz unter Einbindung der NutzerInnenperspektive in die Nachhaltigkeitsbewertung; dissertation, University of Magdeburg, 2015

Since the minimum size of window openings is specified by the state building regulations, I have left out the daylight factor.
If necessary, we can include the quotients mentioned in DIN EN 17037 again. These take into account low, medium and high requirements.

Table 14: Recommendations for the daily exposure time of at least one room of a dwelling to sunlight in the period between 1 February and 21 March of a year, assuming a cloudless sky, DIN EN 17037.

Recommendation level for the tanning duration	Tanning period (1.2. - 21.3.)
Low	1.5 hours
Medium	3.0 hours
High	4.0 hours

The tanning duration criterion is fulfilled if all flats in a building comply with at least the low recommendation level during the specified period and at the same time provide a shading device as described above during the period specified for this purpose.

If all flats are exposed to sunlight for at least three hours in the specified period (medium recommendation level), fulfilment of the criterion is rated 1.25 and a shading device as described above is provided.

If all flats are exposed to sunlight for at least four hours in the specified period (high recommendation level), fulfilment of the criterion is rated 1.5 and a shading device as described above is provided.

The criterion is adopted for school buildings, office and office buildings.

4.2.1.5 Artificial light

This criterion applies to school buildings as well as office and office buildings.

The minimum illuminance for workplaces and classrooms is regulated in a number of regulations, in particular the ASR A3.4 workplace directive for Germany.

It has proven to be beneficial for user satisfaction if the illuminance can be individually adjusted. It makes sense to achieve a maximum brightness that is at least 25% above the minimum value specified in the workplace guidelines.

Taking the circadian rhythm into account in terms of light colour and illuminance is also beneficial, provided that individual adjustment is also possible with automatic control.

The artificial lighting criterion is half-fulfilled if the illuminance can be individually adjusted and is at least 25% above the minimum value specified in the Workplace Directive. (0.5 points)

If the circadian rhythm can also be taken into account with regard to the light colour and this can be individually influenced, the artificial lighting criterion is fully met (1 point).

4.2.1.6 Sound insulation

The criterion only applies to residential buildings or buildings with mixed residential use.

In buildings, adequate sound insulation of a building or room serves to reduce sound levels that affect the building or room from the outside or arise inside the building.

EU Regulation 305/2011 of the European Parliament and of the Council of 9 March 2011 requires noise protection:

"The building must be designed and constructed in such a way that the noise perceived by the occupants or by persons in the vicinity is kept at a level that is not hazardous to health and at which satisfactory night-time rest, leisure and working conditions are ensured."

The minimum requirements for sound insulation in buildings are regulated comprehensively and in detail in DIN 4109-1. Buildings that do not fulfil the sound insulation requirements set out in this standard are considered defective.

If the building achieves sufficient sound insulation against various sound sources in accordance with DIN 4109-1 and the building therefore complies with the standard, the criterion is considered neutral.

If the requirements for increased sound insulation in accordance with DIN 4109-5 are met, the sound insulation criterion is fulfilled (1 point).

4.2.1.7 Room acoustics

Maximum sound pressure level

This criterion applies to office and office buildings.

Details of room acoustic parameters are regulated in the workplace guideline A3-7: Noise.

The total sound level measured in workrooms during the time the room is in use must not exceed maximum levels. These maximum values depend on the activity carried out in the room in question. For assessment purposes, a distinction is made between three activity categories, the precise characterisation of which can be found in ASR-A3-7 Noise.

Category I: high concentration and high speech intelligibility
Category II: medium concentration and medium speech intelligibility
Category III: low concentration and low speech intelligibility

The criterion "maximum sound level at the workplace" is achieved if the maximum sound pressure levels defined in ASR A3-7: Noise for activity categories I and II are undercut by 5

dB(A) in each case. This means that the maximum sound pressure level is 50 dB(A) for activity category I and 65 dB(A) for activity category II (1 point).

Background noise

The sound pressure level of the background noise is also essential for the satisfaction of the room users. A low continuous sound level generally makes it easier for users to communicate with each other. The workplace guideline A3.7: Noise recommends the following sound pressure levels as maximum values for background noise:

Table 15: Recommended continuous sound levels for background noise, extract from ASR A3.7: Noise

Room type	Recommended maximum values for continuous sound levels due to background noise in dB(A)
Conference room, classroom, training room, group room, day care centre, lecture hall, seminar room	35 dB(A)
Two-person offices	40 dB(A)
Open-plan offices	45 dB(A)

The background noise criterion is met if the recommended limit values for continuous sound levels due to background noise are achieved in all rooms listed (0.5 points).

Room acoustic properties

This criterion applies to office and administrative buildings as well as schools and other educational establishments.

Room acoustic properties of the room are also relevant. This refers to the reverberation time of an acoustic impulse. The shorter the reverberation time, the greater the speech intelligibility in general. In ASR A3-7: Noise, room acoustics is not a mandatory criterion. However, as speech intelligibility makes a decisive contribution to user satisfaction and safety, the maximum reverberation times specified in the directive are considered necessary to fulfil the criterion.

The following minimum requirements apply to unoccupied office space, depending on the type:

Table 16: Maximum reverberation times in offices

Type of office space	Maximum reverberation time T
Call centre (office for communication-based services)	0,5 s
Multi-person or open-plan office	0,6 s
One or two-person office	0,8 s

For rooms in schools and other educational establishments, the maximum reverberation time in seconds T_{max} [s] must be determined using a formula that takes into account the room volume V [m]:[3]

$$T_{max} = 0{,}32 \times log(V) - 0{,}17$$

4.2.2 Non-quantitatively measurable criteria

4.2.2.1 Customized office space

The criterion only applies to office and office buildings and schools.
The possibility of using needs-based office space increases user satisfaction and therefore has a positive effect on well-being.[16]
This criterion applies to office and administrative buildings. The criterion is fulfilled if all of the following requirements are met:

- A number of different zones available to support/satisfy the needs of different activities.
- Access to a quiet and private room is available when needed.
- Access to rooms for unscheduled meetings is possible.
- Access to project or team rooms with appropriate equipment is possible if required.

4.2.2.2 View

This criterion applies to office and office buildings, school buildings and residential buildings.

The view from window openings plays a role in the subjective perception of space. In particular, the - at least partial - view of the landscape or nature plays a positive role in user satisfaction.

This criterion is met if building users regularly have the opportunity to use rooms with such a view during working hours.

4.2.2.3 Colour concept

This criterion applies to office and office buildings and school buildings.

In residential buildings, it is assumed that occupants take their own colour preferences into account in purchased or rented living spaces.

Colour is one of the elements that play an important role in interior design, especially in the working environment. In environmental psychology, colour is discussed as an important

[16] Rashid, Mahbub & Zimring, Craig, 2008: A Review of the Empirical Literature on the Relationships Between Indoor Environment and Stress in Health Care and Office Settings. Environment and Behaviour. 40. 151-190. 10.1177/0013916507311550.

environmental factor that has a major influence on human perception and behaviour. Studies prove the influence of the colour design of the working environment on people in three categories: Mood and emotion, physiology and well-being and work-related outcome.[17]

For office, administrative and school buildings, a colour concept tailored to the needs of the users can therefore have a positive influence on user satisfaction and other parameters.

The preparation of a colour concept in the planning phase and its consideration in the construction phase is therefore assessed as fulfilling the criterion.

The perception of colour and form is individual, so 'beautiful' or 'less beautiful' is certainly subjective. When it comes to the material and colour concept, I nevertheless assume that a concept developed for the building alone already leads to an environment that is perceived as harmonious.

4.2.2.4 Material concept

This criterion applies to office and office buildings and school buildings.

In residential buildings, it is assumed that occupants take their own material preferences into account in purchased or rented living spaces.

A stringent material concept for furniture and other items for furnishing office or administrative spaces that is orientated towards the needs of users can have a positive effect on user satisfaction.[18]

The preparation of a material concept in the planning phase and its consideration in the construction phase is therefore assessed as fulfilment of the criterion.

[17] Savavibool, N., Gatersleben, B., Moorapun, Ch., 2018: Savavibool, N., et.al, The Effects of Colour in Work Environment: A systematic review / Asian Journal of Behavioural Studies (AjBeS), 3(13) Sep / Oct 2018 (p.149-160)

[18] D Artan et al, 2022: Influence of Office Building Design on Occupant Satisfaction, IOP Conf. ser.: Earth Environ. Sci. 1101 062028

4.2.2.5 Access to nature

This criterion applies to office and office buildings, school buildings and residential buildings.

Access to natural elements like plants, trees, gardens, roof gardens, planted winter gardens, etc. in the built environment can significantly increase user satisfaction and possibly reduce dissatisfaction with other environmental parameters.[19] The presence of individual opportunities for building users to come into contact with nature in buildings is therefore rated positively:

- Roof gardens or intensively planted roof terraces
- Conservatories with intensive planting
- Accessible garden, park or nature in the immediate vicinity of the building (maximum distance 200 metres)

The criterion is fulfilled if there is a possibility of access to nature in, on or in the immediate vicinity of a building.

[19] Richardson, M., Passmore, H-A., Lumber, R., Thomas, R., & Hunt, A, 2021. Moments, not minutes: The nature-wellbeing relationship. International Journal of Wellbeing, 11(1), 8-33. https://doi.org/10.5502/ijw.v11i1.1267

5. Flow chart

Table 17: Summary of the Health Score procedure

Criterion	Residential building	Office or office building	School building
	Previous research		
Determination of ODA value (capital 2.1)	X	X	X
Determination of radon soil gas (Chapter 2.2)	X	X	X
	Consideration of health-relevant parameters		
Indoor temperature (chapter 3.1.1)	X		
	Compliance with the reference values for the indoor temperature per summer climate region and maximum tolerated excess degree hours, DIN 4108-2 NO: Score "E" YES: more		
Radon (Chapter 3.1.2)	X	X	X
Low load potential	No activity required		
Medium load potential	Structural precautions required		
High load potential	Structural precautions and measurement required		
	Requirements fulfilled? YES: more NO and 3.1.1 also NO: Score "F" NO and 3.1.1 fulfilled: Score "E"		
Outdoor air quality	< 10 WE: Estimate ODA ≥ 10 WE: Determine ODA	Determine ODA	
IAQ: Particulate matter PM_{10}	No consideration		
IAQ: Particulate matter $PM_{2,5}$	ODA1: no air filtration required ODA 2: Separation efficiency $PM_{2,5}$ at least 60% ODA 3: Separation efficiency $PM_{2,5}$ at least 80%		

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	Requirements fulfilled? YES: more NO and 3.1.1 also NO and 3.1.2 also NO: Score "G" NO and 3.1.1 also NO and 3.1.2 fulfilled: Score "F" NO and 3.1.1 fulfilled and 3.1.2 fulfilled: Score "E"
Nitrogen dioxide NO_2	ODA1, ODA 2: Criterion not pursued further, no activity required
	ODA 3: Requirement value for supply air 20µg/m^3
	Requirement fulfilled? YES: more NO, no score from previous criteriaà Score "E" NO, from previous criteria Score "E"à Score "F" NO, from previous criteria Score "F"à Score "G" NO, from previous criteria Score "G"à Score "G"

Criterion	**Residential building**	**Office or office building**	**School building**
VOC	Concept for compliance with the level 1 TVOC guideline value developed and implemented. Requirement fulfilled: Score "D" NO, no score from previous criteriaà Score "E" NO, from previous criteria Score "E"à Score "F" NO, from previous criteria Score "F"à Score "G" NO, from previous criteria Score "G"à Score "G"		
Formaldehyde	60 µg/m3 indoor air Requirement fulfilled: Score "D" NO, no score from previous criteriaà Score "E" NO, from previous criteria Score "E"à Score "F" NO, from previous criteria Score "F"à Score "G" NO, from previous criteria Score "G"à Score "G"		
Health criteria	All criteria YES: Score "D" and on to Wellbeing One criterion NO: Score "E" and cancellation of the procedure Two criteria NO: Score "F" and cancellation of the procedure Three or more criteria NO: Score "G" and cancellation of the procedure		
Consideration of the parameters relevant to well-being			
Quantitatively measurable criteria			
IAQ: thermal	Reaching category I: +1.5 points		
	Achievement of design category II: +1 point Reaching category III: -0.5 points Reaching category IV: -1.5 points		

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Temperature control	Manual controllability of the temperature: +0.5 points Manual controllability of mechanical ventilation, if available: +0.5 points Window opening option: +1.0 points	
IAQ: CO_2 content$_2$	Reaching category I: +1.5 points Achievement of design category II: +1 point Reaching category III: -0.5 points Reaching category IV: -1.5 points	
Daylight and sunlight	Not reaching recommendation level I: - 1 point Reaching the recommendation level "low": 0.5 points Reaching the recommendation level "medium": +1.25 point Reaching the recommendation level "high": + 1.5 points	
Artificial light	Not taken into account	Illuminance can be customised, maximum brightness 125 % of the minimum value of ASR A3.4: +0.5 points Individual controllability of the light colour: +0.5 points
Sound insulation	Increased sound insulation according to DIN 4109-5 achieved: 1 point	For mixed use such as residential buildings
Room acoustics		
Maximum sound pressure level		Activity category I max. 50 dB(A): 1 point Activity category II, max. 65 dB(A): 1 point
Background noise		For all rooms according to Table 15 complied with: 0.5 points
Room acoustic properties		Maximum reverberation times observed: 1 point
Qualitative criteria		
Customised office space		Different zones for different needs, quiet and private rooms, unplanned meetings, meeting rooms with equipment: all fulfilled: 2 points
View	Rooms with a view of the landscape or nature regularly available: 1 point	

Colour concept	Concept created in the planning phase and subsequently implemented: 1 point
Material concept	Concept created in the planning phase and subsequently implemented: 1 point
Access to nature	Possibility of access to nature in, on or in the immediate vicinity of the building: +2 points

Table 18: Overview of the points to be achieved per criterion

Criterion	**Residential building**		**Office and office building**		**School building**	
	max.	min	max	min	max	min
IAQ temperature	+1,5	-1,5	+1,5	-1,5	+1,5	-1,5
Influenceability						
Temperature	+0,5	0	+0,5	0	+0,5	0
Ventilation	+0,5	0	+0,5	0	+0,5	0
Windows	+1,0	0	+1,0	0	+1,0	0
IAQ CO_2	+1,5	-1,5	+1,5	-1,5	+1,5	-1,5
Daylight and sunlight	+1,5	-1,0	+1,5	-1,0	+1,5	-1,0
Influenceability of artificial light						
25% brighter			0,5	0	0,5	0
Light colour			0,5	0	0,5	0
Sound insulation	+1,0	0				
Sound pressure level			2,0	0		
Background noise			0,5	0	0,5	0
Room acoustics			1,0	0	1,0	0
Customised offices			2,0	0		
View	1,0	0	1,0	0	1,0	0
Colour concept			1,0	0	1,0	0
Material concept			1,0	0	1,0	0
Access to nature	2,0	0	2,0	0	2,0	0
SUM	**9,5**	**-4**	**17,5**	**-4**	**14,0**	**-4**

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Table 19: Classification of levels A to E in the Health Score

	% points	Residential building	Office and office building	School buildings
	> 90%	> 8,5	> 15,0	> 12,5
	> 70%	> 6,5	> 12,0	> 9,5
	> 50%	> 4,5	> 8,5	> 7
	> 0%	> 0	> 0	> 0
	≤ 0%	≤ 0	≤ 0	≤ 0

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By combining technical knowledge with user experience, we make healthy building clear and achievable — especially for organisations that are not yet actively working on it. The Health Score offers a practical framework to assess health and wellbeing in buildings and to support better decisions from the earliest design stages.

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