Demo-Project 1000 0

General building information 0

Address 0

Name of the project / building

Address

Postal code

City

Architects, planners, consultants 0

Architects / planners

Building physics

Building services, heating & energy consultants

Additional experts

Area characteristics 0

Lot size in m²

of which: built-up area

of which: undeveloped, sealed

of which: undeveloped, not sealed

Gross floor area in m² GFA (according ÖN B1800)

Net floor area NGF in m² (according ÖN B1800)

Main floor space (rentable / sellable) in m²

General information on energy systems 0

Energy Performance Certificate

☐ The building complies with the criteria of a certified or certifiable passive house of the Passive House Institute in Darmstadt.

Passive House energy indicator HWB m kWh / m²

if applicable: acc. PHPP

Passive House Certificate / Calculation

Additional information 0

[click for more information]:

Here you can add additional information about your buílding.

Photos

Here you can upload images (JPG) about your object on the platform. Please add a separate document on the photo rights.

General project description

Please upload a general description of your project.

Plans

Here you can upload design plans and supplementary plan interpretations / visuals.

A	Location and Facilities	200	0
A.1	Infrastructure	50	0
	[click for more information]: The term “infrastructure” refers to the distance from the building to public transport, the facilities for local supply, social infrastructure as well as recreation areas and recreational facilities		
A.1.1	Connection to public transport	20	0
	Distance in metres to the next station of a means of public transport (beeline) **Comments:** • In rural or peripheral areas on the outskirts of the city, call taxis and share taxis can be regarded as an alternative to the traditional means of public transport. The operational concept (stating the cost when using these services) for the call taxi or share taxi provided must be submitted as evidence. The classic use of taxis and/or rental cars does not qualify as public transport.		
	○ ≤ 300 m beeline	8	
	○ ≤ 500 m beeline	6	
	○ ≤ 1000 m beeline	2	
	○ > 1000 m beeline	0	
	Intervals of public transport in minutes With call taxis and share taxis the average wait time according to the operatio schedule is to be used for the evaluation.		
	○ ≤ 15 Min.	8	
	○ ≤ 30 Min.	6	
	○ ≤ 60 Min.	2	
	○ > 60 Min.	0	
	Time to get to the centre by public transport in minutes The “centre” refers to the centre of a suburb or town with a good infrastructure (e.g. shops, restaurants, public administration). If a building is located in such a centre, the sub-criterion < 10 minutes is fulfilled.		
	○ ≤ 10 Min. or the building is in the centre within infrastructure	8	
	○ ≤ 20 Min.	6	
	○ ≤ 30 Min.	2	
	○ > 30 Min.	0	
	Verification Map (M 1:5,000 or larger recommended) showing the location of the building, the available stops of public transport and a radius of 300, 500 and 1,000 metres (beeline) around the building, timetable of public transport, and an indication of the time it takes to get to the next centre. With call taxis and share taxis: Evidence of the operational concept, stating the average cost and the average wait times to be expected and, as the case may be, the time it takes to get to the next centre.		

A.1.2	Quality of local supply	10	0
	Shopping for daily needs: shops, supermarket, bakery, etc		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Restaurants, café, bars		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Post office and/or bank		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Basic services: Hairdresser, drycleaner, etc.		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Verification		
	Map (M 1:5,000 or larger recommended) showing the location of the building, the available infrastructure facilities and a radius of 500 and 1,000 metres (beeline) around the building (measured from the main entrance).		
A.1.3	Quality of social infrastructure	10	0
	Kindergarten or other child care facilities (child minder etc.)		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Primary school or secondary school		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Social facilities (such as social meeting points or youth centres)		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	

	○ > 1000 m	0	
	General practitioner/specialist doctors/health centres		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Pharmacy (also if within a doctor's office)		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Verification		
	Map (M 1:5,000 or larger recommended) showing the location of the building, the available social infrastructure facilities and a radius of 500 and 1,000 metres (beeline) around the building.		
A.1.4	Proximity to recreation areas and recreational facilities	10	0
	Public park/green space/forest/ contiguous recreation area		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Sport facilities (e.g. tennis court, sports field, fitness centre, outdoor pool, indoor pool etc.)		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Cultural facilities such as cinema, theatre, museum		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	
	○ > 1000 m	0	
	Other open spaces with recreational value such as pedestrian zones, markets and market places, public playgrounds		
	Other open spaces with recreational value are areas in the public or semi-public space if due to their character these can deliver recreational value. Normally this will be a traffic-calmed zone (pedestrian zone, market place, public square) which due to their design and furnishings invites people to stay. Playgrounds in proximity to the residential building (even if outside the residential complex) are considered as such facilities.		
	○ ≤ 500 m	4	
	○ ≤ 1000 m	2	

	○ > 1000 m	0	

Verification

Map (M 1:5,000 or larger recommended) showing the location of the building, the available nearby recreational area and recreational facilities and a radius of 500 and 1,000 metres (beeline) around the building.

A.2	Location safety and building land quality	50	0
A.2.1	Basic risk of natural hazards	10	0

Risk of national hazards

Location safety evaluates the basic risk of natural hazards (such as floods, heavy rainfall, avalanches, mudflows/landslides as well as earthquakes), the radon exposure from the subsoil and the proximity to electrical plants with possible health risks. The analysis of surrounding risks as well as corresponding constructional measures – if a risk potential is identified – can contribute greatly to the longterm use of buildings and decrease the risk of potential consequential costs. Moreover, the quality of the building land is evaluated before the building is erected or before renovation measures are taken and the (future) degree of sealing is evaluated.

The object is not located within an area in danger of being affected by floods or mountain torrents.

○ true	2	
○ not true	0	

If the object is located in a danger zone, the restrictions of use resulting from this fact must be documented. It may be necessary to ensure by means of compensation measures that the dangers for the object can be minimised or eliminated. If this is not possible, no positive object evaluation can be given, regardless of the other object properties.

Verification

Danger zone plans

The object is not located in an area in danger of being affected by avalanches.

○ true	2	
○ not true	0	

Verification

Danger zone plan

The object is not located in an area in danger of being affected by mudflows/landslides.

○ true	2	
○ not true	0	

Verification

Danger zone plan

The object is not located within an area in danger of being affected by earthquakes. If it is, proper constructional protection measures were taken.

○ true	2	
○ not true	0	

Verification

Earthquake danger: Proof by means of earthquake danger map (zone 0-3), proof according to ON B 1998 (static assessment)

The radon risk potential was determined using radon map or measurement according to ÖN S 5280-1. If necessary due to the local radon exposure, constructional measures are taken.

	○ true	2	
	○ not true	0	

Verification

Radon potential map for Austria (source: OENRAP) or measurements according to ÖN S 5280-1; description of constructional protection measures according to ÖN S 5280-2 (if necessary)

A.2.2	Quality of building land and sealing	20	0

Building land quality / degree of land consumption / urban sprawl

	○ Use of an existing building or area recycling after demolition/new building without increasing the degree of sealing	10	
	○ Area recycling while at the same time increasing the previously used built-up area OR concentration of existing structures (on designated building land)	8	
	○ Construction on developed and designated building land in settlement area (development already available)	5	
	○ Construction on building land as settlement addition (development required)	3	
	○ Re-zoning of building land with necessary new development	1	
	○ New building after re-zoning of ecologically valuable areas	0	

Verification

Area zoning and land use plan; in case of new designation of building land: greening and description of status of property before re-zoning (e.g. agriculturally used area, etc.)

Sealing

a) The unsealed areas on the property are completely or partly underslung and less than 1.5 m filled, their portion in the property area (minus the overground built-up area) is:

	○ > 70%	9	
	○ 30 to 70 %	6	
	○ 10 to < 30%	3	
	○ < 10%	0	

b) The unsealed areas on the property are not underslung or, if underslung, more than 1.5 m filled, their portion in the property area (minus the overground built-up area) is

	○ > 70%	10	
	○ 30 to 70 %	7	
	○ 10 to < 30%	4	
	○ < 10%	0	

Green roofs

When calculating the share of greened roofs in the total roof area, all roof areas of all buildings on the property must be considered. In case of a combination of pitched and flat roofs, the actual areas (and not the projected areas) are used to calculate the total roof area.
The evidence needs to contain a detailed plan including the calculation.

○ is > 80%	10	
○ is 60 to 80%	8	
○ is 40 to 60%	6	
○ is 20 to 40%	4	
○ is 10 to 20%	2	
○ is < 10%	0	

Verification

Sealing:
Calculated proof including outdoor facility plan and profile in case of substructures of the unsealed areas indicating:

- Total property area in m^2
- Building-related area (overground) in m^2 according to ÖN B 1800
- Filling height in m in case of substructures under unsealed areas
- Unsealed (=permeable) areas on property in m^2

Roof greening:
Calculated proof including plan overview with a description of the planned/realised roof greening measures
Share of green roof area in percent in the total roof area (application of the area specification from the energy indicator calculation according to OIB-RL 6 or PHPP referring to the external dimensions)

A.2.3	Alternating magnetic fields in low frequency range	10	0

In the planning phase

☐ Recommended distances to high frequency landlines (depending on the voltage) are respected for the planned buildings OR if the distances are not as recommended, an overview measurement on the property is required (the magnetic flux density results in a value B < 0.1 µT at representative positions). *Recommended distances*: • 20 kV....at least 80m • 110kV....at least 95m ◦ 220 kV....at least 120m • 380 kV....at least 160m	3	
☐ There are no buried high frequency cables at or close to the property or the recommended distances from the planned buildings to buried high frequency cables are complied with (20 m to the left and right of the route of the buried cable). If the recommendation for the distances are not complied with, an overview measurement is necessary (the magnetic flux density results in a value B < 0.1 µT at representative positions).	3	
☐ There is no transformer station at this or an adjoining property or at the adjoining public ground OR if there is a transformer station, an overview measurement is necessary at representative positions of the property (the magnetic flux density results in a value B < 0.1 µT).	4	

	☐ Distance recommendations to the previously mentioned electrical plants are not complied with or an overview measurement of the magnetic flux density (at the property) results in a value B ≥ 1,0 µT.	0	

Verification in the planning phase

- Investigation and documentation of the distances to high frequency landlines, high frequency buried lines, transformer stations: Building site inspection or checking of plans with the local energy suppliers
  - If necessary, overview measurement of representative (exposed) positions at the property

After completion / with existing buildings
The measurement of the magnetic flux density B in exposed rooms results in a:

◯ B ≤ 0.1 µT	10	
◯ 0.1 < B ≤ 0.2 µT	8	
◯ 0.2 < B ≤ 0.4 µT	6	
◯ 0.4 < B ≤ 1 µT	4	
◯ B > 1 µT	0	

Verification after completion / with existing buildings

Measurement of the magnetic flux density at representative positions (if necessary, exposed rooms) in the building (short term measurement – 30 minutes if no case is suspected, long term measurement of 2 x 24 hours if a case is suspected). The apartment for measurement has to be chosen according to the highest exposure to be expected.

A.2.4	Low frequency-pulsed high frequency fields	10	0

In the planning phase

◯ The power flux density of low frequency-pulsed high frequency fields at all measurement positions selected to be representative is ≤ 1 mW/m². Overview measurements at the construction site are not necessary if there are no transmitters of such fields within a radius of 100 m from the property border.	10	
◯ The power flux density of low frequency-pulsed high frequency fields at all measurement positions selected to be representative is ≤ 3 mW/m². Overview measurements at the construction site are not necessary if there are no transmitters of such fields within a radius of 100 m from the property border.	5	
◯ The power flux density of low frequency-pulsed high frequency fields at all measurement positions selected to be representative is higher than 3 mW/m².	0	

Verification planning phase

- Map indicating the nearest mobile phone transmitters and the distance to it including a 100 m radius from the relevant property borders. Information about the position of mobile phone transmitters at http://www.senderkataster.at/
  - If necessary overview measurement of the power flux density of low frequency-pulsed high frequency fields (frequency range 800 –3000 MHz) at exposed positions at the construction site (if necessary) including the measurement protocol

After completion (new buildings) / with renovations and existing buildings
The measurement of the power flux density S in exposed interior spaces with the windows closed results ...

◯ S ≤ 0.01 mW/m²	10	
◯ 0.01 mW/m² < S ≤ 0.1 mW/m²	8	

	○ 0.1 mW/m² < S ≤ 1 mW/m²	6	
	○ 1 mW/m² < S ≤ 3 mW/m²	4	
	○ S > 3 mW/m²	0	

Verification after completion (new buildings) or with renovation and existing buildings

Measurement of the power flux density of low frequency-pulsed high frequency fields (frequency range 800 – 3000 MHz) in the interior with the window closed and open (for the evaluation the values with the window closed are to be used). The apartment for measurement has to be chosen according to the highest exposure to be expected and can be different from a show flat if such an apartment exists.

A.3	Facilities quality	50	0

[click for more information]:

The facilities quality describes the quality of the interior development, special features of the apartments (or the apartment complex), the availability of apartment-related open spaces (balconies, terraces etc) as well as burglary protection features.

A.3.1	Interior development	10	0

Basic aspects regarding the interior development

☐ Women's parking area in immediate proximity to the entrance area/elevators (with underground carparks) or close to the entrance when parking is in an open area. This criterion is considered fulfilled even if no car park spaces were set up at the property.	4	
☐ Entrance areas and staircase boast natural light and/or sufficient artificial light (of at least 300 lx on the ground). Frightening areas are avoided.	4	
☐ Access options for delivery services are in place. This criterion is considered fulfilled if in the direct surroundings of the object (100 meter from the entrance) there is enough car park space for delivery services in the form of general delivery/loading zones.	2	

Verification of interior development

Layout plan for (underground) garages and interior development including a description of the lighting concept

Bicycle parking bays for tenants

Bicycle parking bays are considered as such only if they meet the following minimum criteria:

Quality-related minimum requirements:

- Parking bays covered throughout (manoeuvring space does not have to be covered)
- Easily accessible, i.e. closer to the entrance area than the car park spaces
- At least 10% of the parking bays have to be at street level (the others can be set up in the basement/underground garage), they must be close to the entrance ramp or the vertical transportation within buildings, the access must be unobstructed and no more than two doors are allowed to reach it).
- Lockable i.e. within a lockable room or with the option to easily secure the bike frame by using a bike lock

Size of parking bay, distances and manoeuvring space:

- Distance between bicycles with normal parking: at least 80cm; distance between bicycles

in case of a height offset: at least 45cm
- Distance from bicycle to wall: at least 35 cm
- Depth of parking bay at least 2m with vertical parking, at least 3.2m with overlapping front wheels
- Manoeuvring space for parking and moving of bicycles: depth of at least 1.8m

○ Less than 1 bicycle parking bay per 70 m² of living space	0	
○ At least 1 bicycle parking bay per 70 m² of living space	2	
○ At least 1 bicycle parking bay per 60 m² of living space	4	
○ At least 1 bicycle parking bay per 50 m² of living space	6	
○ At least 1 bicycle parking bay per 40 m² of living space	8	
○ At least 1 bicycle parking bay per 30 m² of living space	10	

Verification of bicycle parking bays for tenants

Indication of living space and number of bicycle parking bays fulfilling the minimum requirements described, calculated proof with additional plan of bicycle parking bays (including size of parking bays, distances and manoeuvring space)

A.3.2	Facilities of apartment building	20	0

Facilities of apartment building

☐ Garden/open space/rooftop terrace accessible for the tenants	2	
☐ Playground or playroom for infants, children and/or teenagers	2	
☐ Communal room for children and/or teenagers	2	
☐ Communal room/meeting room for tenants (parties, meetings etc.)	2	
☐ Laundry and drying room	2	
☐ Wellness facilities (sauna, steam bath, infrared cabin etc.)	2	
☐ Outdoor or indoor pool	2	
☐ Fitness area including indoor or outdoor gym equipment	2	
☐ In the residential building itself there is a workshop room for smaller repairs on the part of the tenants (e.g. for bicycles, cars etc.) that is accessible to everyone.	2	
☐ In the residential building itself there is a supermarket / grocery.	2	
☐ In the residential complex there are shared offices or workrooms to be used by the tenants.	2	
☐ Central satellite or cable TV system	2	
Other special facilities (A)	2	

Due to the heterogeneous nature of the apartments provided the facilities of the buildings can differ greatly. Therefore, the evaluation system of ÖGNB allows for the definition of up to five additional features. These need to be explained separately in the evidence. The following criteria apply:

1. The facilities need to be accessible to all tenants.
2. The general operating costs normally comprise the costs for these facilities. In special cases (e.g. when delivering defined services) a service-related charge is allowed.
3. The service-related charge should not give rise to an income-depending segmentation of the tenants. This would be the case if the regular use of specific facilities/services would imply a clear increase of more than 15% of the running housing costs (normally rent + operating costs).

	Other special facilities (B):	2	
	Other special facilities (C):	2	
	Other special facilities (D):	2	
	Other special facilities (E):	2	
	Facilities of the apartments		
	☐ At least 75% of the apartments contain storage facilities inside the apartment (storage room/walk-in closet/recesses for storage in apartment) totalling at least 2 m². Cellar compartments belonging to the apartments can be included when calculating the size.	3	
	☐ Realisation of equipotential volumes in sleeping areas and measures for voltage disconnection (or shielding) of the installations in these rooms (avoiding electro smog).	3	
	☐ During the planning phase the tenants already had the chance to state their special wishes regarding the apartment design.	5	
	Verification		
	Description of facilities including location in layout plan		
	Theme homes		
	☐ Assisted living (linked to social meeting point/direct assistance)	8	
	☐ Multi-generation living	8	
	☐ Intercultural living	8	
	☐ Comprehensive codetermination models/joint living groups	8	
	☐ Working and living	8	
	Other: please name	8	
	Verification		
	Theme homes: Description of concept (social focus is mandatory in order to be accepted)		
	☐ **No facilities**	0	
A.3.3	Apartment-related open spaces	10	0
	Appartement buildings		
	Share of housing units with a directly allocated open space of more than 4 m²		
	○ more than 80 %	10	
	○ 60 to 80%	9	
	○ 40 to 60%	8	
	○ 20 to 40%	4	
	○ 10 to 20%	2	
	Share of housing units with a directly allocated open space of less than 4 m²		

	○ more than 80%	7	
	○ 60 to 80%	6	
	○ 40 to 60%	5	
	○ 20 to 40%	3	
	○ 10 to 20%	1	
	○ More than 90% of the housing units have no directly allocated open space.	0	
	town house complexes/one-/two-family houses: Private garden		
	Share of housing units with a private garden of more than 100 m²		
	○ more than 80%	10	
	○ 60 to 80%	9	
	○ 40 to 60%	6	
	○ 20 to 40%	4	
	○ 10 to 20%	2	
	Share of housing units with a private garden of at least 40 m²		
	○ more than 80%	8	
	○ 60 to 80%	7	
	○ 40 to 60%	5	
	○ 20 to 40%	3	
	○ 10 to 20%	1	
	○ More than 90% of the housing units have no private garden.	0	
	Verification		
	Total number of housing units, calculated proof of the number of housing units with the described open spaces and location in layout plan or outdoor plan (several balconies, terraces, loggias per apartment can be summarised for the criterion “Open space > 4m²”)		
A.3.4	Burglary protection	10	0
	○ Burglar alarm (according to VSÖ or VDS guidelines or ÖN EN 50131) or BUS-connected security system	10	
	○ Burglar-resistant doors and windows and/or shutters (according to ÖN B 5338 or ENV 1627)	5	
	○ No measures implemented	0	
	Verification		
	• With a planning certificate: description of security concept, taking into account the criteria listed in the tender documents • With a construction certificate: inspection on site, installation certificate for burglar alarms according to VSÖ or VDS guidelines or EN 50130 or EN 50131 • Evidence of integration of burglar-resistant doors and windows and/or shutters (according to ÖN B 5338 or ENV 1627) in the form of an invoice/delivery slip • With apartment complexes this criterion is considered fulfilled if critical areas are secured through burglar-resistant doors and windows (at least ground floor areas, accessible balcony doors, apartment doors).		

A.4	Accessibility	50	0
	[click for more information]: This section describes the quality of a building with regard to its accessibility.		
A.4.1	Accessibility	50	0

BASIC REQUIREMENT: BARRIER-FREE ACCESS

NOTE: It is only when the building has basically been developed barrier-free that quality points for the barrier-free design of the apartments can be awarded. Otherwise the entire object is considered not barrier-free.

☐ The common areas and the access to the apartment have been designed to be barrier-free — 10

The following criteria must all be met (requirements according to ÖN B 1600 and follow-on standards):

- Step-free and threshold-free access to the building, ramp slope <6%, width of pathways at least 120cm
- Surfaces in the outside area with good rolling characteristics, slip-resistant and non-reflecting floor coverings in the entrance area
- Elevator (from basement to top floor) available (not necessary in one- or two-family houses/townhouses)
- Staircase: handrail on both sides, handrail for children (h=75cm); high-contrast step marking
- Width of corridor in front of entrance doors and when changing directions at least 1.50 m;

All main entrances have a clear passage width of at least 1.20 m (with one- or two-family houses/townhouses and side entrances 1.0 m is enough).

- Doors in the outside area and entrance doors have a minimum width of 90cm (clear width).
- Thresholds may not be higher than 2.0 cm.
- For common areas, a turning circle for wheelchairs of 1.5 m is proven (in front of and behind the entrance door, in front of the elevator door).
- Intercom system / mailbox h=85-100cm above floor level
- High-contrast marking of glass doors and large areas of glass, at least 30% of grey tone fraction

☐ There is no barrier-free access to the apartments. — 0

Verification

Plan of the building

Barrier-free design of apartments, maximum configuration

Requirements:

1. Consideration of all requirements of ON B1600 (and follow-on standards)
2. In general: barrier-free development of object is ensured

The following criteria according to ÖN B 1600 must be considered:

- Doors: at least 80cm (clear width), except for entrance doors
- Position of door at least 50cm out of the corner of the door handle side; operating force of up to 25 N, if higher motor-assisted operation
- Bathroom and toilet doors open and unlock to the outside
- Width of corridor: at least 120 cm
- Horizontal manoeuvring space: Turning circle of 150cm when changing directions as well

as in strategic areas (e.g. kitchen, bathroom, toilet); slip-resistant floor coverings
- Controls: light switches=85-100cm, electric sockets at least h=50 cm above floor level, distance from side wall of at least 50cm
- Grip height of window catches: 120cm above floor level
- Motion sensor (for light) in toilet/anteroom
- With maisonette apartments: Step width of at least 120cm for the later integration of a stair lift

☐ Barrier-free access to the appartements is not possible:	0
○ in at least 40% of the housing units and utilisation units	40
○ in at least 30% of the housing units and utilisation units	30
○ in at least 20% of the housing units and utilisation units	20
○ in at least 10% of the housing units and utilisation units	10
○ in less than 10% of the housing units and utilisation units	0

Verification for maximum configuration

- Common areas and access to the apartments: Planning proof
- Housing units, maximum configuration: Plan including description of measures to ensure barrier-free accessibility

Barrier-free design of housing units, adaptability

Adaptability: There is planning proof of the fact that separate rooms (bathroom and toilet) or one wet room available from the beginning can be changed into a combined wet room (toilet and shower or bath) that can be reached and used barrier-free and has a turning circle of 1.50 m.

To reach barrier-free means: that in apartments with several floors the wet room is located on the entrance level. To use barrier-free means: that a turning circle of 1.50 m is possible.
The following concessions are made with regard to allowing for a turning circle of 1.50 m:

1. With walk-in showers this requirement can be fulfilled in case of a level difference of up to 3cm when the shower screen is removed.
2. Washing machines are not considered because they can be removed.
3. In wet rooms boasting both a shower and a bathtub it should be possible to remove the bathtub. To this purpose, the shower must be installed as a walk-in and by removing the bathtub a turning circle of 1.50 m must be ensured.
4. A toilet separate from the wet room should be allowed according to Ö-Norm B 1600 if the partition is done as a light-weight construction, does not contain any pipes and the floor is done without any gaps throughout.
5. Block frame doors with doors opening to the inside are allowed (even when intersecting the turning circle) if they can open to the outside by turning the block frame.
6. A sink can be installed so as to be wheelchair-accessible. A maximum depth of 20 cm according to the Ö-Norm can be taken into account.

☐ Barrier-free access to the appartements is not possible:	0
○ in at least 60% of the housing units and utilisation units	30
○ in at least 50% of the housing units and utilisation units	25
○ in at least 40% of the housing units and utilisation units	20
○ in at least 30% of the housing units and utilisation units	15
○ in at least 20% of the housing units and utilisation units	10
○ in at least 10% of the housing units and utilisation units	5

○ in less than 10% of the housing units and utilisation units	0

Verification of adaptability

- For a planning certificate: Layout plans with clear evidence of barrier-free accessibility
- For a construction certificate: Report including realisation documentation for barrier-free accessibility

B	Economy and Technical Quality	200	0
B.1	Profitability within the life cycle	100	0
B.1.1	Profitability analyses LCCA (Life Cycle Cost Analysis)	50	0
	Simplified operating costs calculations are used for the following categories:		
	☐ Energy costs: fuels, electricity	5	
	☐ Supply and disposal costs: water and sewerage, waste	5	
	☐ Maintenance costs: follow-up costs for ongoing maintenance	5	
	☐ Cleaning service costs for general areas	5	
	☐ Administration and service costs	5	
	☐ Profitability analyses in accordance with ÖNORM M 7140 / VDI 2067 / ISO 15686-5 were conducted for the building (simplified life cycle costs analysis). In case of detailed verifications (sum of overall follow-up costs in accordance with ÖN B 1801-2) this requirement is met as well.	25	
	☐ None of the stated verifications have been met or cannot be presented for the building.	0	
	Verification • Proof of operation costs calculations • Proof of (simplified) profitability analyses in accordance with ÖN M 7140 / VDI 2067 / ISO 15686-5 • Proof of detailed life cycle costs analyses (in accordance with ÖN B 1801 cost group)		
B.1.2	Integral Planning and variation analysis	25	0
	☐ Complete execution plans and documentation of building technology system in place.	0	
	☐ The project is the result of a competition or evaluation procedure. The guidelines constituted by the Chamber of Architects and Engineering Consultants are met or consulted with the Chamber of Architects and Engineering Consultants. Energy efficiency and sustainability criteria are part of the contest.	15	
	☐ An extensive interdisciplinary planning team ranging from architecture, building technology, building physics and free-space planning is involved in the definition of goals for the building optimization. For renovation projects: there is at least one independent consultant for the ecological optimization of the project.	10	
	☐ There are different planning variations as basis for execution. For new buildings this refers to development studies including building technology, for renovations variants for the optimization of thermal frame and building technology. These options were assessed according to their ecological impact (e.g. energy consumption, avoiding CO2 etc.).	10	
	☐ The required documents for the building cannot be presented.	0	
	Verification • Documentation of planning process • Presentation of planning team • Protocol on outcome including reason for selecting review process and/or competitions, award criteria • Documentation of variant analysis, e.g. building studies, renovation concepts etc.		
B.1.3	Basis for building operation	25	0
	☐ A manual on how to use heating and cooling systems (and possibly easy maintenance work) is in place.	5	

Upload manual

☐ A manual for technical staff on maintenance and operation is in place.	5	

Upload manual for technical staff on maintenance and operation

☐ A facility and/or building management system is in place.	10	

Upload description of Facility Management concept

☐ The buildings energy consumption is continuously measured (possibly using smart-metering system). Minimum requirement: separate accounting of energy consumption for heating, hot water (according to energy sources), auxiliary power for solar system, if applicable, electricity consumption for use of building (if required: according to utilisation units). Data is collected as part of energy accounting and is then analysed.	10	

Verification

Data collection on power consumption in line with the k:a Building and Renovation criteria catalogue for residential buildings:
Depending on the type of building, different minimum data can be collected to receive relevant measurement results, which help to identify the quality of the building and the optimum operation.
For single-family homes, the following minimum data (measuring points) should be collected:

- Consumption rate of used fuel (e.g. gas consumption in m^3 - measured by means of a gas meter, electricity consumption in kWh, measured using an electricity meter, wood pellets consumption in kg, oil consumption in liters – measured, for example, with an oil dipstick inside heating oil tanks,...)
- Heat quantity meter solar system (the heat quantity meter should be installed on the same side as the solar system, if a heat transfer system is used)
- Water quantity hot water (measured by means of water meters in m^3 including documentation of set hot water temperature)
- Water quantity cold water (measured by means of water meters in m^3 as total quantity including hot water)
- Electricity consumption (measured by means of an analogue electricity meter in kWh, with existing buildings/renovations consumption rates must be collected at least once a month; a so-called Smart Meter is recommended, as it allows users to monitor the course of power consumption in 15-minute intervals)

For multi-family housing, the following data should be collected:

- Consumption quantity of used fuels (e.g. gas consumption in m^3 - measured by means of a gas meter, electricity in kWh – measured by means of an electricity meter, wood pellets consumption in kg, oil consumption in liters – measured, for example, with an oil dipstick inside heating oil tanks, ...)
- Heat quantity meter solar system (the heat quantity meter should be installed on the same side as the solar system, if a heat transfer system is used)
- Heat quantity meter per housing unit
- Water quantity hot water per housing unit (measured by means of water meters in m^3 per housing unit including documentation of set hot water temperature, it is recommended to install a heat quantity meter for hot water consumption, which measures the energy content of the hot water in kWh)
- Water quantity cold water per housing unit (measured by means of water meters in m^3 per housing unit as total quantity including hot water)
- Electricity consumption per housing unit (measured by means of an analogue electricity meter in kWh; optional, however, a meter is recommended to monitor the course of power consumption)
- Power consumption of general power (measured by means of an analogue electricity meter in kWh; optional, however, a meter is recommended to monitor the course of power consumption)

☐ There are no additional manuals for building operation.	0	

B.2	Construction site management	30	0
B.2.1	Construction site management and logistics	30	0

General waste mangement aspects

☐ Provision of hollows for sorting construction waste on the site is/will be announced and implemented.	5
☐ Announcement of disposal service includes construction of one or several collection points (e.g. sorting landfills) with lockable fencing and the required number of containers of various sizes. Trained staff is provided for the sorting landfills. Sorting construction waste extends beyond the construction debris mass separation regulation (“Baurestmassentrennungsverordnung”).	5
☐ None or few waste management measures have been implemented.	0

Verification waste management

Waste management concept

Renovations

☐ Outdoor storage of sand, gravel, debris is avoided. (e.g. storage in sealed containers, hollows covered with nets after on-site working hours, removal of hollows with net covering).	5
☐ Spraying of waste fractions during reloading and ongoing cleaning of surfaces affected by renovation (walking paths, parking areas,...).	5
☐ Use of visual cover and dust protection nets (on facade) and use of sealed material collecting basin, 2 – 3 m in height, to avoid dust formation during impact of protective materials.	5
☐ Crane hollows are used instead of debris chutes.	5

Verification renovations

Presentation of simplified concept for construction site management; documentation of implemented measures through photographs/construction site plans

New buildings: small-scale or average-size construction sites

(< 50,000 m² BGF (Brutto-Grund-Fläche, gross floor area) incl. garages and < 15,000 m² property size)

☐ Transport management partially in place: traffic caused by trucks is reduced as empty runs are avoided	5
☐ Outdoor storage of sand, gravel, debris is avoided. (e.g. storage in sealed containers, hollows covered with nets after on-site working hours, removal of hollows with net covering).	5
☐ Excavated material is reused on site, temporary storage option is planned.	5
☐ Water connection for dust control is planned.	5

Verification new buildings

small-scale, average-sized and large-scale site:

Presentation of construction management concept; site plan, photo documentation of implemented measures

Large construction sites

≥ 50,000 m² BGF (gross floor area) incl. garages or >= 15,000 m² property size

	☐ Traffic caused by trucks is reduced as empty runs are avoided. Rail connections or connections to waterways – if available nearby – are used for environment-oriented traffic management.	4	
	☐ Outdoor storage of sand, gravel, debris is avoided. (e.g. storage in sealed containers, hollows covered with nets after on-site working hours, removal of hollows with net covering).	4	
	☐ Excavated material is reused on site, temporary storage option is planned.	4	
	☐ Secured construction roads, tyre cleaning arrangements and water connection for dust control are planned.	4	
	☐ Appointment of an environmental coordinator for environmental aspects during planning phase and for coordinating agents on site at later stage	4	

Verification large-scale site

Presentation of construction management concept; site plan, photo documentation of implemented measures

Assessment extisting building, older than 10 years

If the existing building is 10 years old, the criterion is fulfilled when no extensive renovations have been made during this time. If there have been renovation jobs on the facade (or, for example, the building was adapted extensively or extended), proof of logistic measures has to be presented in accordance with the new building criteria.

	☐ The building is at least 10 years old and has not undergone any major renovations or adaptations during this time.	30	

Verification existing building, older than 10 years

Verification by owner proving that the building is older than ten years and has not undergone any extensive renovations or adaptations

No logistics measures were implemented

	☐ None of the mentioned measures have been implemented.	0	
B.3	Flexibility and durability	40	0
B.3.1	Dimensioning and static concept	20	0
	☐ The static dimensioning of the basic construction (bearing elements, ceilings) allows extended use (from living space to office space / small service companies / care facilities).	5	
	☐ The rooms' ceilings in the entire building are at least 2.70 meters.	5	
	☐ The basic construction includes easily interchangeable subsystems (with the non-bearing elements).	10	
	☐ None of the mentioned measures have been implemented.	0	

Verification

- Submission or execution plans
- Static concept / calculations
- List of superstructures of interior components

B.3.2	Expandability/ Core removal	20	0
	☐ Building units can be easily connected / separated in terms of layout.	5	

	☐ Supply shafts allow for building extension or separate building units or for adaptation of the technical building system.	5	
	☐ Electric installations are done using bus systems, or sufficient capacity of ducts is proved.	5	
	☐ Detailed report of measures for construction and technical building system for possible extended use.	5	
	☐ None of the mentioned measures have been implemented.	0	

Verification

- Submission or execution plans (status plan)
- Plans for technical building system
- Construction and equipment description providing detailed information on extended use opportunities.

B.4	Fire protection	30	0
B.4.1	Requirements for separate fire sub-section components	15	0
	☐ The requirements of bearing units, ceilings, balcony panels and sloping roofs (with a less than 60 degree compared to horizontal view) in terms of fire resistance classes are met and comply with current regulations for new buildings (OIB-RL 2 in the current version).	5	
	☐ The requirements in terms of fire resistance classes of precast construction units (walls, ceilings) are met and comply with current regulations for new buildings (OIB-RL 2 in the current version).	5	
	☐ The requirements in terms of fire resistance classes of partition walls are met and comply with current regulations for new buildings (OIB-RL 2 in the current version).	5	
	☐ Existing buildings: The requirements in terms of fire resistance classes of bearing units, ceilings, balcony panels and sloping roofs or precast construction units or partition walls are not met and do not comply with current regulations for new buildings (OIB-RL 2 in the current version).	0	

Verification

The fire resistance classes of construction units include the following general characteristics:

- R...load-bearing capacity
- E...barriers
- I...thermal insulation

REI 30 indicates that the construction unit will meet all criteria (load-bearing capacity, barriers and thermal insulation) for 30 minutes.

Reference: Construction units which can endure fire for 90 minutes must consist of building materials of at least Euro-class A2 for the reaction to fire.

Proof of fire resistance classes of described construction units complying with OIB-RL 2

B.4.2	Fire alarm facilities	10	0
	☐ There is a home detector (in line with TRVB N 115) at least in the main area of every apartment (multi-family building) or on every floor of the house (single family house, detached house).	5	
	☐ Fire detectors in place (in line with TRVB S 123) in transport area of apartment buildings.	5	
	☐ None of the mentioned measures have been implemented.	0	

Verification

Proof of existing fire alarm systems

B.4.3	Special fire extinguisher systems	10	0
	☐ Extended automatic fire-fighting equipment in accordance with TRVB S 122 in place.	5	
	☐ Sprinklers in accordance with TRVB S 127 in place.	5	
	☐ None of the mentioned measures have been implemented.	0	
	Verification		
	Proof of fire extinguisher systems		

C	Energy and Supply	200	0
C.1	Energy demand	75	0
C.1.1	Heat consumption HWB (Heizwärmebedarf, Heat demand)	45	0
	☐ Passive house (PH) (certified or certifiable PH according to the PHI Darmstadt guidelines): Requirement Heat demand (HWB) (according to PHPP - Passive house project planning package (a calculation program) <= 15 kWh/m^2_{EBF}a or Heating load < 10 W/ m^2_{EBF} An alternative is a verification for passive houses (HWB <= 15 kWh/m^2_{EBF}a according to PHPP) by using the passive house planning package PHPP to determine heat demand. EBF.....Energy reference space based on PHPP calculation, detailed definition: see current version of guideline for passive house planning package (e.g. Passivhaus-Projektierungspaket 2007 PHPP2007: Anforderungen an qualitätsgeprüfte Passivhäuser, Fachinformation PHI-2007/1, hg. v. PHI Darmstadt, 2007)	45	
	☐ Existing buildings, renovations, new buildings: Requirements of OIB-RL6-Energy Performance Certificate as per 1.1.2010 for new buildings with comfort ventilation are not met (e.g. application of building permit prior to 1.1.2010).	0	
	The requirement of OIB guideline 6 as per 1.1.2010 for new buildings with comfort ventilation (i.e. ventilation system with heat recovery) is met: $HWB_{BGF,WG,max,Ref}$ = 19*(1+2,5/lc) - 8)(0 points) The maximum score is awarded for buildings with a heat consumption ($HWB_{BGF,WG,Ref}$) of 10 kWh/m^2_{BGFa} (45 points). Values in between are interpolated linearly. TQB defines a higher standard of quality when appointing points for heat consumption: the starting level equals requirements for new buildings with comfort ventilation, and the highest classification level ensures high-end technological standards (PH according to the PHI Darmstadt guidelines). From the user's perspective, a building's energy demand is only compared with the highest quality categories (energy efficiency classes A++ or A+). Naturally, this means that renovations or existing buildings which do not meet these benchmarks, are considered to be in poor shape, i.e. buildings are of poor quality. Therefore these buildings should be documented individually by means of an energy performance certificate, to identify energy-savings due to renovations. However, in the TQB logistics existing buildings should always be compared with the most sophisticated buildings as well (renovations of passive house standard included). The minimum requirement for the specific heat consumption (for positive scoring within the TQB catalogue) is based on the requirement standard of the OIB guideline 6 for new residential buildings (including ventilation systems with heat recovery) starting from 1.1.2010 (general formula: 19*(1 + 2,5 / lc) – 8). The allowed maximum heating consumption for a positive scoring depends on the building's compactness (A/V ratio or characteristic length) and is <= 1.0 at max. 58.5 kWh/m^2a (less compact buildings) for lc, and >= 5.0 at 20.5 kWh/m^2a for lc (more compact buildings). For 1.0 < lc < 5.0 the highest possible $HWB_{BGF,WG,Ref}$ is determined as follows: 19*(1 + 2.5 / lc) – 8. The highest point total is awarded independently from the A/V ratio for buildings with a $HWB_{BGF,WG,Ref}$ of proof-of-identity procedure according to PHPP (passive house planning package 2007 or higher) with a HWB of <= 15 kWh/m2$_{EBF}$a. The various requirement values take different reference areas and calculation rules into consideration. lc --- lc (characteristic length of building according to OIB-RL6-Energy Performance Certificate) HWB ---	45	

$HWB_{BGF,Ref,WG}$ (specific heat consumption of building with reference to reference climate according to OIB-RL6-Energy Performance Certificate)

Verification

Energy Performance Certificate

C.1.2	Final energy demand (EEB, Endenergiebedarf)	25	0
	☐ Passive house (certified or certifiable following the PHI Darmstadt guidelines): requirements in terms of heat demand, air tightness and overall primary energy demand (including domestic electricity) are met. This refers to the recommendation that the primary energy demand for heating, hot water and auxiliary power should not exceed 40 kWh/m²a based on PHPP calculation.	25	
	Determining points for final energy demand: This factor is determined based on the allowed maximum final energy consumption, calculated with the building technology reference equipment. The specific final energy demand $EEB_{max,BGF,WG,SK}$ (OIB guideline 6) and the existing specific final energy demand $EEB_{vorh,BGF,WG,SK}$ for the residential building must be specified in kWh/m²a. The improvement in relation to the requirement value is assessed. For a ratio EEB_{vorh}/EEB_{max} = 1.0 five points are awarded, for a ratio EEBvorh/EEBmax ≤ 0.2 the maximum points (25) are granted. In between values are interpolated.	25	

The specific final energy demand ($EEB_{BGF,SK}$) refers to the calculated energy quantity per squaremeter of conditioned gross floor space based on the location climate needed to cover the annual heat demand and hot water heat demand (including expenses for building technology, heat technology-energy demand) of residential buildings. Electricity for lighting and domestic electricity are not taken into consideration. With non-residential buildings also the cooling demand and effort for building technology and lighting are considered as well. With this parameter the general standard of usable energy demand as well as the efficiency of building technology systems can be determined.

$EEB_{vorh,BGF,WG,SK}$

Source: Energy performance certificate

$EEB_{max,BGF,WG,SK}$

Source: Energy performance certificate

If the ratio of EEBvorh/EEBmax > 1.0, 0 points are awarded.

Verification

Energy performance certificate

C.1.3	Air tightness of building	10	0

Air tightness of building

○ There is no air tightness test after completion.	0	
○ n_{50} > 3.0 h^{-1} (with existing buildings and renovations)	0	
○ n_{50} > 3.0 h^{-1} (with new buildings)	0	
○ n_{50} > 1.5 h^{-1} (new buildings with mechanically operated ventilation systems with or without heat recovery)	0	
○ result of air tightness test: n_{50} is 2.0 ≤ 3.0 h^{-1}	1	
○ result of air tightness test: n_{50} is 1.5 < 2.0 h^{-1}	2	
○ result of air tightness test: n_{50} 1.0 < 1.5 h^{-1}	5	
○ result of air tightness test: n_{50} 0.6 < 1.0 h^{-1}	8	
○ result of air tightness test: n_{50} ≤ 0.6 h^{-1}	10	

Air tightness of passive houses

○ result of air tightness test: n_{50} ≤ 0.6 h^{-1}	10	
○ result of air tightness test: n_{50} > 0.6 h^{-1}	0	

Verification

- Planning: target value, possibly tender documents
- Construction: air tightness measurement following ÖN EN 13829 (one series of measures each with negative pressure and excess pressure)
- For passive houses the target value of n_{50} <= 0,6 h^{-1} in semi-detached houses in every building unit must be reached.
- For residential apartment buildings with comfort ventilation (with heat recovery) air tightness test must be conducted in 20% of the units, but at least in 4 units. Of these at least three tests must be done in corner apartments. Apartments subject to testing must be randomly chosen. For the remaining facilities measurements in 5% of the units is sufficient for verification.

C.1.4	Heat recovery optimization	10	0

Lack of verification

○ There is no proof of thermal bridges or the quality standards are not met.	0	

Maximum increase of the mean U-value of the building shell through thermal bridges

Avoiding thermal bridges helps to reduce heat loss through transmission as well as construction damages caused by dampness. Thermal bridges can cause room-side low surface temperatures on external components, which may result in condensation and eventually mould. No thermal bridges reduce the likelihood of damages, health risks in terms of indoor air pollutants (mould spores) and overall energy consumption.

The Maximum increase of the mean U-value of the building shell through thermal bridges is:

○ ≤ 0.05 W/m²K – the building has reduced thermal bridges.	5	
○ ≤ 0.04 W/m²K	6	

○ ≤ 0.03 W/m²K	7	
○ ≤ 0.02 W/m²K	8	
○ ≤ 0.01 W/m²K	9	
○ ≤ 0.00 W/m²K - the building is free of thermal bridges.	10	

Verification

- Drawing of relevant construction details (M 1:20 or larger)
- The following details/thermal bridges must be drawn/reported: connections of windows, window doors and house doors (especially lower connections of windows are problematic), external wall/basement ceiling or interior wall/basement ceiling, balcony, external wall/floor ceiling, connection verge/eaves, penetration or weakening of insulation layers, further thermal bridges depending on project circumstances
- Plans (layouts, sections)

Quantitative proof of thermal bridge impact

1. Determining length-related thermal bridge loss coefficient P_{sii} and punctual thermal bridge loss coefficient C_{hii} by means of calculations following ÖN EN ISO 10211 or by use of comparable values from thermal bridge catalogues
2. Determining length of relevant (length-related) thermal bridges l_i and number of punctual thermal bridges n_i
3. Determining the conductive value increments caused by thermal bridges $P_{sii} * l_i * f_i * f_{FHi} + C_{hii} * n_i * f_i * f_{FHi}$. f_i refers to temperature correction factor, f_{FHi} correction factor floor space radiators
4. Increasing mean U-value of building shell through (length-related) thermal bridges (= sum of conductive value increments caused by thermal bridges divided by the surface of thermal building shell)

For the PHPP-calculations the thermal bridges of insertion of windows at an average increase in U-value must be considered as well.

C.2	Energy generation	75	0
C.2.1	Primary energy demand (PEB, Primärenergiebedarf)	50	0

Specific primary energy demand according to OIB RL 6 2011

Specific primary energy demand [kWh/m²$_{BGF}$a] (for building operation, incl. domestic electricity; based on location climate and considering Austrian conversion factors) according to OIB RL6 is: 50

0 points if the Specific PEB_{BGF} ≥ 200 kWh/m²$_{BGF}$a
50 to 1 points (linear interpolation) if the Specific PEB_{BGF} 50 < 200 kWh/m²$_{BGF}$a
50 points if the Specific PEB_{BGF} ≤ 50 kWh/m²$_{BGF}$a

PEB_{BGF} OIB RL6 (2011)

kWh / m²$_{BGFa}$

Determining primary energy demand on the basis of calculated results of energy performance certificate according to OIB-guideline 6 (2011)

Primary energy demand according to PHPP

50

Primary energy demand (non-renewable) [kWh/m^2_{EBF}a] according to PHPP, based on energy supply surface and location climate (for heating, hot water, ventilation, auxiliary electricity for solar systems, domestic electricity and other energy uses), considering conversion factors intended in PHPP is:

0 points if the PEB_{EBF} ≥ 235 kWh/m^2_{EBF}a
50 to 1 points (linear interpolation) if the PEB_{EBF} 120 < 235 kWh/m^2_{EBF}a
50 points if the PEB_{EBF} ≤ 120 kWh/m^2_{EBF}a

PEB_{EBF} according to PHPP2007

kWh / m^2_{EBFa}

Determining primary energy demand (non-renewable) in accordance with PHPP calculation. When using PHPP calculation, it will be necessary to extend the parameters by PV; this must be taken into account when verifying.

Verification

- Determining primary energy demand on the basis of calculated results of energy performance certificate according to OIB-guideline 6 (2011)
- Optionally, determining primary energy demand (non-renewable) in accordance with PHPP calculation. When using PHPP calculation, it will be necessary to extend the parameters by PV; this must be taken into account when verifying.

C.2.2	Photovoltaic system	20	0

Grid-connected photovoltaic system

A measure which is taken into consideration are photovoltaic systems that are connected to the grid. Free-standing systems are not considered, only those connected with the building or adjacent buildings, e.g. carports (roof integration, facade integration, support on roof tops).
Points are awarded if the facility is planned using an adequate calculation program (e.g. PV-Sol) and energy is mainly used internally. The internal use and the amount of used electricity are shown in the planning documents.
Determining points depends on the annual yield of the system and on internal use of PV electricity. The calculation is done on a monthly basis as of now.
Intermediate values are determined through linear interpolation.

Example 1: Single family house with 150 m^2_{BGF}
150 m^2_{BGF} * 7 kWh_{End} / m^2_{EBF}a = 1,050 kWh/a
This corresponds to a size of approx. 1.15 to 1.25 kWpeak depending on climate, orientation, roof inclination and type of system.

Example 2: Single family house with 150 m^2_{BGF}
150 m^2_{BGF} * 14 kWh_{End} / m^2_{EBF}a = 2,100 kWh/a
This corresponds to a size of approx. 2.3 to 2.5 kWpeak depending on climate, orientation, roof inclination and type of system.

☐ No grid-connected system	0	
○ ≥ 6 kWh_{End} PV-electricity per m² BGF (corresponds to approx. 0.06 m² PV-surface/m^2_{BGF})	4	
○ ≥ 8 kWh_{End} PV-electricity per m² BGF (corresponds to approx. 0.08 m² PV-surface/m^2_{BGF})	8	
○ ≥ 10 kWh_{End} PV-electricity per m² BGF (corresponds to approx. 0.1 m² PV-surface/m^2_{BGF})	12	
○ ≥ 12 kWh_{End} PV-electricity per m² BGF (corresponds to approx. 0.12 m² PV-surface/m^2_{BGF})	16	

	☐ **Additional Points** if the amount of PV-electricity used in building (internal use) > 30%	4	

Verification

- System planning (primarily internal use; indication of positioning and surface of solar modules, interconnection) and yield calculation using appropriate software program with local climate information, considering local shading
- Data sheets of components chosen (modules, inverters)

C.2.3	Energy efficient ventilation system	10	0

Quality criteria

The criteria definition follows recommendations of the klima:aktiv criteria catalogue (V.5.2, May 2010). The first goal is to reduce electricity demand for running ventilation systems. The second goal is to achieve a high heat supply rate of the comfort ventilation and thereby reducing heating consumption as much as possible.
Energy demand of comfort ventilation systems with heat recovery can vary considerably. The first prerequisite for energetic efficiency of the system is the assessment of air amount for estimated demand. Another prerequisite is the adjustment of the system according to the assessment. Points are awarded if both the assessment calculations and adjustment protocol are included (5 points). The air volume should be dimensioned on the hygienic air change. To achieve high air quality an air volume of 30 m^3/(h*Person) is generally sufficient in the living space. This allows for a good indoor air quality of IDA 3 category according to DIN EN 13779. Criteria refer to electricity demand and heat supply rate.

○ Power consumption ≤ 0.45 Wh/m^3, heat recovery ≥ 75%	10	
○ Power consumption > 0.45 Wh/m^3, heat recovery ≥ 75%	8	
○ Power consumption ≤ 0.45 Wh/m^3, heat recovery from 50 < 75%	7	
○ Power consumption > 0.45 Wh/m^3, heat recovery from 50 < 75%	6	
○ Return air systems in most frequented rooms with power consumption ≤ 0.25 Wh/m^3	5	
○ There is no ventilation system in the units which meet the criteria mentioned.	0	

Verification

In analogy to the klima:aktiv catalogue, Residential building new (V.5.2, May 2010)

- Assessment according to demand: Proof e.g. with PHPP statutory notices, ventilation (for download at www.passiv.de), Adjustment: Proof e.g. with PHPP statutory notices, ventilation (for download at www.passiv.de)
- Line scheme of ventilation system with specification of air volume and channel dimensions for each line section
- Air volume-specific electric power consumption: Verification by means of certificates. Power consumption including control and without anti-freeze heating to be determined.
- Heat supply rate: Proof of requirements through test certificate or certificate, e.g. PHI

C.2.4	CO2-emissions from building operation	50	0
	Points calculation CO_2 emissions derived from final energy demand according to OIB guideline 6 verification procedure [kg CO_2 equiv./m^2_{BGF}a] (heating and hot water preparation incl. required auxiliary electricity of heat supply, solar and ventilation systems) regardless of the building's compactness	50	

0 points if CO_2 emissions ≥ 27 kg CO_2 equiv./m^2_{BGF}a
1 to 50 points (linear interpolation) if CO_2 emissions < 27 ≥ 4 kg CO_2 equiv./m^2_{BGF}a
50 points if CO_2 emissions < 4 kg CO_2 equiv./m^2_{BGF}a

CO_2 emissions

kg CO_2 equiv./m^2_{BGF}a

The following CO2 coefficients of the OIB guideline 6 (2011) are used:

Energy source	CO_2 in kg/MWh
Coal	337
Heating oil	311
Natural gas	236
Biomass	4
Electricity Austria-Mix	417
District heating from heating station (renewable)	51
District heating from heating station (non-renewable)	291
District heating from highly efficient combined heat and power plants DEFAULT	73
District heating from highly efficient combined heat and power plants	individual proof
Waste heat (Default value)	20
Waste heat (Best value)	individual proof

These factors include the energy needed to build transformation and transport systems and for the conversion of primary energy to final energy.

Verification

Determining CO_2 emissions on the basis of parameters of energy performance certificate according to OIB-guideline 6, taking the final energy demand into consideration (see C.1.2.)

C.3	Water demand and water quality	50	0
C.3.1	Individual consumption-based billing	5	0
	○ Separate cold water meters in all units	5	
	○ There is only central water metering.	0	

Verification

- Description according to HVAC (heating, ventilation and air-conditioning) tenders
- On-the-spot inspection

Water consumption has triple impact in the billing of overhead costs: as drinking water for different purposes, as wastewater and as higher energy bill due to hot water share. If costs for 1 m^3 of water are currently low, they are likely to go up due to increased commercial drinking water resources. Aside from financial aspects, sustainable water resource management is sensible with respect to preserving the environment, energy savings and climate protection.

C.3.2	Rain water use	15	0
	☐ Use of rain water for toilet	5	
	☐ Use of rain water for washing machine	5	
	☐ Use of rain water for watering green areas	5	
	☐ No use of rain water	0	

Verification

- Description according to HVAC (heating, ventilation and air-conditioning) tenders
- On-the-spot inspection

C.3.3	Water-saving sanitary facilities	20	0
	☐	3	

	New building/ Renovation: water-saving toilets (2-amount-rinsing technology 3/6l // Start/Stop button, flush volume 6 to 9l) OR: **Retrofitting (inventory/renovation)**: use of weight to regulate water consumption in flushing tank for old, large flushing tanks		
	☐ **Grey water recycling (for toilet flush); waterless urinals and/or vacuum toilets**	10	
	☐ Shower heads (max. 12l/min)	5	
	☐ Sink valves (max. 6l/min) optimized	5	
	☐ Sink valves (max. 9l/min) economical	2	
	☐ No water-saving sanitary facilities	0	
	Verification • Description according to HVAC (heating, ventilation and air-conditioning) tenders • On-the-spot inspection		
C.3.4	Hygienic quality of cold and hot water	25	0
	☐ The drinking water is taken from public drinking water faucets. If there is no connection to the public water grid, proof is shown that the water quality of the house corresponds to the quality of water of the public grid in terms of hygiene.	5	
	☐ The cold water taken has a temperature of max. 20 degrees at least 2 minutes after using the water valve. This is achieved through effective insulation of drinking water plumbing.	10	
	☐ The cold water taken needs more than 2 minutes after using the water valve to reach a max. temperature of 20 degrees.	0	
	☐ The hot water taken has a min. temperature of 55 degrees after 1 minute of using the water valve. This is achieved through effective insulation of drinking water plumbing and dimensioning of hot water supply.	10	
	☐ The hot water taken needs more than 1 minute after using the water valve to reach a min. temperature of 55 degrees.	0	
	Verification • Description according to HVAC (heating, ventilation and air-conditioning) tenders • Proof of connection to public supply grid; possibly proof of quality of house water supply; on-the-spot check including appropriate test protocols.		

D	Health and Comfort	200	0
D.1	Thermal comfort	50	0
D.1.1	Thermal comfort in winter	20	0

Thermal comfort in winter: Simplified verification

Design conditions
Indoor air temperature 18-22°C, air speeds < 0.15 m/s, relative humidity 45-55%, with ventilation systems: minimal supply air temperature 17°C

○ Temperature difference between wall-surface and indoor air < 4 K, temperature difference between glass surfaces (windows) and indoor air < 6 K	10
○ Temperature difference between wall surface and indoor air < 1 K, temperature difference between glass surfaces (windows) and indoor air < 4 K	20

Thermal comfort in winter: Detailed verification

The comfort level categories A and B are defined in the ÖN EN ISO 7730 (2006) - verification is done through dynamic simulation (or CFD) using suitable validated calculation programs. The PMV-Index (Predicted Mean Vote) and the PPD-Index (Predicted Percentage of Dissatisfied), as well as the local discomfort parameter are determined. These are defined for the following occupied area in main living areas: 0.8 m distance from windows, 2 m in height and 0.5 m distance from interior walls or walls without windows and doors.
The PMV-Index demonstrates the expected mean assessment of the thermal comfort level on the 7-degree scale. The PPD-Index indicates the percentage of people who are dissatisfied with the thermal comfort level.

○ Verification in accordance with EN ISO 7730, comfort level category B is reached	15
○ Verification in accordance with EN ISO 7730, comfort level category A is reached	20

No verification of required quality

○ The above mentioned criteria for thermal comfort in winter cannot be verified.	0

Verification

Simplified verification:
The better the exterior construction is insulated, the higher the indoor surface temperature. This applies to glass surfaces in particular: windows with low glazing and overall U-value are warmer on the inside. Thus the difference between air temperature and surface temperature of the enclosing space is lower, which occupants perceive as comfortable and pleasant. A simplified verification of the U-values of the exterior construction can therefore be carried out, if the additional comfort requirements (max indoor air speeds, relative humidity) are met by means of a ventilation system.

The design requirements are as follows:

- Indoor air temperature 18 to 22°C;
- Air speeds < 0.15 m/s;
- relative humidity 45 to 55%;
- for ventilation systems: minimal supply air temperature 17°C

As shown in the example, the simplified verification is carried out for the exterior wall:
TSurface wall = T1 - [Uwall x Awall x (T1 – T2)] / alphai

- Uwall: Heat penetration coefficient of wall [W/m²K]
- Awall: Space of considered wall cut-out (1 m²)
- T1: (setpoint)Room temperature (20°C)
- T2: (Norm-)external air temperature [°C]

- alphai: inner heat transition resistance (for walls - horizontal heat flow: 7,69) [W/m²K]
- TSurface wall: Surface temperature wall [°C]

Detailed verification:
The comfort level categories A and B are defined in the ÖN EN ISO 7730 (2006) - verification is done through dynamic simulation (or CFD) using suitable validated calculation programs. The PMV-Index (Predicted Mean Vote) and the PPD-Index (Predicted Percentage of Dissatisfied), as well as the local discomfort parameter are determined. These are defined for the following occupied area in main living areas: 0.8 m distance from windows, 2 m in height and 0.5 m distance from interior walls or walls without windows and doors.
The PMV-Index demonstrates the expected mean assessment of the thermal comfort level on the 7-degree scale. The PPD-Index indicates the percentage of people who are dissatisfied with the thermal comfort level.

D.1.2	Thermal comfort in summer	30	0

Standard verification procedure in accordance with ÖN B 8110-3
Immission area-related storage-capable mass:

○ > 5000 kg/m² above limit value	30	
○ 3000 to < 5000 kg/m² above limit value	25	
○ 1500 to < 3000 kg/m² above limit value	20	
○ Summer efficiency in accordance with ÖN B 8110-3 not met; air-conditioning with/without cooling unit	15	
○ Summer efficiency in accordance with ÖN B 8110-3 not met; air-conditioning with/without cooling unit	0	

Dynamic building simulation (or PHPP in its current version)

○ Verification through dynamic building simulation (or PHPP in its current version), in order to prove that the exceeding comfort temperature of 25°C is reached on not more than 10% of annual hours for all critical living and bedrooms.	30	

Verification without calculation

○ Proof of outside, flexible sun protection with a z-value of ≤ 0.27 for windows facing South, East and West. In addition, evidence should be presented to show the option of cross-ventilation in the respective rooms. An automatic activation of the sun protection device is recommended when occupants leave the building.	20	

Verification

• Mathematical proof of summer efficiency in accordance with ÖNORM B 8110 - 3 (1999) for the most critical room in each apartment (including data on required sun protection measures).
• For passive houses only: determining excess temperature frequency by using the passive house project package [PHPP 2007 or respective current version] for critical rooms (calculation for the entire building is unsuitable for verification purposes). If this calculation shows that the comfort limit temperature exceeds 25°C in more than 10% of the hours, additional measures to prevent overheating are required and need to be verified (e.g. outside, flexible sun protection devices).
• Mathematical proof by means of dynamic building simulation for critical rooms. It needs to be verified that temperature exceeds the comfort limit by 25°C in a maximum of 10% of the annual hours (data includes climate information from a hot year).
• Proof of outside, flexible sun protection device with a z-value of <= 0,27 for windows facing south, east and west (and inbetween). For residential buildings it is recommended that the sun protection device is activated automatically when users leave the house. In addition, proof of cross ventilation in the respective rooms is required.

The two most critical rooms of an apartment are assessed so as to have an overview of the residential building. The assessments of all apartments are the basis for a medium value of the entire unit for determining the points.

D.1.3	Building automation and occupant interference	20	0

Quality standard of building automation

○ Automation concept in place, implementation of functions using BUS-system; simple handling, programing using touch screen or similar interface	15	
○ Automation concept in place, implementation of functions using BUS-system possible	10	
○ Automation concept has been prepared for particular functions, but not implemented yet	6	
○ No automation concept, but can be installed.	3	

Extra points: Interference

☐ All comfort parameters can be influenced by occupants when automation concept is in place.	5	
☐ No automation concept is planned or realised.	0	

Verification

Tender (electrical installations), brief description of building automation (implemented functions), type of interference by occupants (if applicable), description of how to use building automation

D.2	Indoor air quality	50	0
D.2.1	Ventilation	25	0

Fresh-air systems without heat recovery

☐ Demand-driven air supply: Control for each unit (e.g. controlling CO_2 or humidity), manual controls require at least three control levels	4	
☐ Design in accordance with H 6038, DIN 1946 or standard occupancy 30m^3/(h,pers)	4	
☐ Air openings (air outlets in exterior walls) are soundproof, have insect screens and are easily accessible	4	
☐ Air openings are positioned above the heating unit so as to warm up external air and avoid draught	4	
☐ Sufficiently large ventilation areas to ensure additional air flow between rooms. Free area >= 150 cm^2, such as overflow diffuser or door pane shortened approx. 12 to 15 mm	4	

Comfort ventilation with heat recovery

☐ Design in accordance with ÖN H 6038 , DIN 1946 or through supply air volume for standard occupancy 30 m3/(h,pers) airflow (minimum air exchange rate: 0.3 1/h)	4	
☐ Easily accessible and replacable filters, automatic indicator for filter change	2	
☐ Outside air filter F 7 in accordance with DIN EN 779, exhaust air filters minimum G4 in accordance with DIN EN 779	3	
☐ The unit can be adjusted according to demand on at least three control levels	4	
☐ Unit has bypass to avoid Heat Recovery in summer	3	

	☐ Fresh air intake at a height of at least 1.5 metres and placed sufficiently far from parking areas and waste storage sites	2	
	☐ Disbalance between fresh air and exhaust air flow permanent <= 10%	3	
	☐ Max. internal vents from leakages 3% at 100 Pa	2	
	☐ User manual/user information is in place (extractor operating in recirculating-air mode only, condenser dryer is the only option, heating unit and fireplaces can only be operated in the air-tight shell without using the surrounding air)	2	
	☐ The building does not have **any ventilation system** supplying the main living rooms with fresh air, or the built-in ventilation system **does not comply with any of the points in the above-mentioned criteria.**	0	

Verification

- Proof by planner (HVAC and sanitation) or ventilation manufacturer verifying that the above-mentioned requirements are met
- Product data sheet of ventilation system, design calculation, installation protocol
- Proof of design and of installation of the ventilation system for passive houses can be done using a notice, which can be downloaded at www.passiv.de or is part of the PHPP-CD-Rom delivery package.

D.2.2	Low emission and low pollutant construction materials in interior fittings	40	0
	☐ **Emission levels in construction materials for the interior finishing were not considered.**	0	

NEW BUILDINGS and RENOVATION WORK

In existing buildings the indoor air quality is determined by measuring formaldehyde and the sum of VOCs – see below.

Comprehensive product management (recommended)

Ideally the verification of use of low-emission and low-pollutant products is conducted through comprehensive product management, which is used in the planning stage and throughout the implementation. Idealy, the comprehensive product management comprises all requirements and materials listed below. In case this is not possible, separate and individual supporting documents can be submitted.

Comprehensive product management comprises the following disciplines: architects (LG05, 06, 12), roofers (LG21), WDVS (LG44), windows (one LG of LG51-54), tilers (LG24), painters (LG45-47, 49), floor layers (LG50), parquet floor layers (LG38).

	☐ As part of the project, a comprehensive product management was implemented, ensuring, among other things, compliance with the quality standards for flooring installation products, floor coverings, wood-based materials and wall and ceiling coats. In addition further trades and product groups were monitored in accordance with the TQB-guideline requirements. In existing buildings the indoor air quality is determined by measuring formaldehyde and the sum of VOCs – see below. Results of measurements have to be verified by another procedure.	24	

Verification of a comprehensive product management

Product management is the careful selection and operational control of construction materials (construction products and chemicals) to avoid indoor air pollutants.

It is conducted by independent third parties (internal and external) and comprises the establishment of ecological criteria for the tendering procedure and for awarding contracts, approval of construction products before they are used on construction site, as well as continuous quality assurance at the construction site.
The successful implementation is documented in a brief report by a professional consultant and is subject to indoor air measurement control.

ALTERNATIVELY, Simplified verification:

If the product management does not comprise all requirements and materials, separate and individual supporting documents will be submitted.

☐ **Flooring installation products or adhesives** are low in emissions or no flooring installation products/adhesives are used. 5

The aim is to avoid excessive pollutant concentrates in the indoor air caused by application of adhesives by selecting low-emission materials. Flooring products include primers/filler compounds, adhesives/fixations and underlays for flooring installation.

TVOC	Max.
primers, filler compounds	< 100 µg/m³
adhesives/fixations	< 200 µg/m³
underlays for flooring installation	< 500 µg/m³

Verification flooring installation products

The developer´s standard fitting offer is subject of the assesment.

These criteria are met for products

- which meet the requirements of the Association for Emission-Controlled Primers (GEV) for low-emission primers according to EMICODE EC1: www.emicode.de
- **Exception:** If there are compelling technical reasons for not using an EC1 primer, these reasons must be given. In this case, a low-solvent adhesive must be used (e.g. Giscode D1, RU1).
- which are listed on the criteria platform of the klima:aktiv house (www.baubook.at/kahkp).
- If floor coverings are used which do not need adhesion, the criteria is met.

☐ **Floor coverings** are low in emissions or only uncoated natural stone grounds or/and tiles in the main living areas used. 7

Floor coverings include all floor coverings laid on surfaces, laminate, elastic floor coverings and carpet floors. The standard fittings of main living areas (living rooms and bedrooms) are assessed. The assessment is based on the standard fittings offered by the architect. If different floor coverings are used, all products must be optimized. If 2 different floor coverings (excluding tiles in bathroom) are used, they account for 50 % of the assessment, for 3 floor coverings they account for 33%, respectively.

The following requirements for emission levels must be met:

B1) Level, flat products made of wood and wood-based materials (e.g. laminate floors, prefabricated parquet

Substance	**End value (28th day)**
Formaldehyde	<0.05 ppm
Organic compounds boiling point 50-250 °C	<300 µg/m³
Organic compounds boiling point > 250 °C	<100 µg/m³
CMT substances	<1 µg/m³
CMT substances = carcinogenic, mutagenic, teratogenic substances (substances toxic to reproduction)	

Requirements for emission levels for level, flat products made of wood and wood-based materials:

B2) Elastic floor coverings (e.g. cork, linoleum, rubber, polyolefin,..)

Substance	**Max. area-specific emission rate after 28 days**
Aromatics incl. styrene	70 µg/m² h
Halogenated volatile organic compounds	40 µg/m² h

Total volatile organic compounds	380 µg/m² h
Odor and irritants:	
Nonanal	70 µg/m² h
Hexanal	20 µg/m² h
Styrene	30 µg/m² h

Requirements for emission levels for elastic floor coverings:

B3) Textile floor coverings:
Emissions from TVOC are below 300 µg/m³.

B4) Uncoated natural stone flooring/tiles:
If uncoated natural stone flooring or/and tiles are used in the main living areas (living room, bed rooms etc.), the criterium „low-emission floor coverings“ is met.
The criterion is met if low-emission ceiling and wall coats are used, if cork or glutinous paints are used, or if no (new) paint is applied on wall and ceiling areas (renovations, existing buildings).
Measurements for existing buildings: (or renovations without measures in interior design): For mere inventory valuations, only the existing fitting can be assessed. As there is a frequent lack of information on the products to be used, the VOC and formaldehyde measurements replace the proof of product.

Verification floor coverings

The developer´s standard fitting offer is subject of the assesment.

Proof is presented by means of certificates (Österreichisches Umweltzeichen, Deutscher Blauer Engel, natureplus, GuT-Siegel) or through a manufacturer’s declaration in the baubook (www.baubook.info). Alternatively, test certificates are accepted which were issued according to the measurement criteria of one of the certificates mentioned.

B1) Floor coverings made of wood and wood-based materials: Austrian Eco-label ZU 07 wood and wood-based materials:

- Deutscher Blauer Engel RAL UZ 38 for low-emission products made of wood and wood-based materials
- „natureplus“ Directive 0209 floor coverings made of wood and wood-based materials
- Measurement report (test method following one of the test marks mentioned above)
- The requester presents an inspection report following procedures for emission assessment of farmaldehyde and other volatile compounds from an inspection authority, which is approved by the federal agency for material research and inspection (annex 3 to the award criteria RAL-ZU 38). The report confirms compliance with this requirement.
- Manufacturer’s declaration on the internet platform baubook

B2) Elastic floor coverings:

- Austrian Eco-label UZ 56 floor coverings
- „natureplus“ Directive 1200 Elastic floor coverings
- Measurement report (test method following one of the test marks mentioned above)
- The requester presents an inspection report following procedures for emission assessment of farmaldehyde and other volatile compounds from an inspection authority, which is approved by the federal agency for material research and inspection (annex 3 to the award criteria RAL-ZU 38). The report confirms compliance with this requirement.
- Manufacturer’s declaration on the internet platform baubook

B3) Textile floor coverings:

- GuT seal (Asociation of the European Carpet Industry) www.gut-ev.de
- Austrian Eco-label 56 floor coverings "natureplus“ Directive 1400 textile coverings
- Measurement report in compliance with above-mentioned directives
- The requester presents an inspection report following procedures for emission assessment of farmaldehyde and other volatile compounds from an inspection authority, which is approved by the federal agency for material research and inspection (annex 3 to the award criteria RAL-ZU 38). The report confirms compliance with this requirement.
- Manufacturer’s declaration on the internet platform baubook

B4) Uncoated natural stone floorings/tiles:

Description standard fitting in living rooms and bedrooms, product names of manufacturer, if necessary, photographic documentation after completion

☐ **Wood and wood-based materials** (within the airtight level) are low in emission. 7

If large quantities of wood-based materials are used, their compounds such as formaldehyde or wood own materials like terpene, may affect the indoor air, even if the limits set by law are met. The use of enhanced low-emission wood-based materials is regarded as positive.
Note: The indoor air-effective emission surfaces are produced by the floor, wall and ceiling building materials which are found within the air resistance level (incl. construction material, which constitutes the air resistance level). Due to their specific composition, woods which are rich in substances, such as larch, pine and spruce, are likely to show higher emission levels.
For low-emission level flat products made from wood-based materials the following requirements regarding emissions apply, if they are not separated from the indoor air by an airtight layer:

Requirements for emission levels for products made from wood-based materials:

Substance	**End level (28th day)**
Total volatile organic compounds (TVOC)	300 µg/m^3
Total semi volatile organic compounds (SVOC)	100 µg/m3
VOC classified as K1, K2; M1, M2; R1, R2 (according to TRGS 905,RL 67/548 EWG); IARC Group 1 u. 2A; MAK III1; III2.	n.b. (<1 µg/m^3)
Formaldehyde	0.05 ppm

The criterion is met if the low-emission wood-based materials used (within the airtight layer) have proof of quality in accordance with natureplus, Austrian Eco-label, Blue Angel or a declaration on the internet platform baubook, or if solely unbonded/untreated solid wood products – with the exception of woods which are rich in substances (e.g. larch, spruce, pine,...) – are used inside the airtight layer.

If no wood products are used inside the airtight layer, the low-emission criteria with regard to wood-based materials is met as well.

Verification Wood and wood-based materials

The developer´s standard fitting offer is subject of the assesment.

Products which are awarded with one of the following eco-labels, meet the requirements:

- natureplus (Directive RL0200ff for products made of wood and wood-based materials)
- Austrian Eco-label (Directive UZ 07 „Wood and wood-based materials“)
- German Blue Angel (Directive RAL 38 for „Low-emission products made of wood and wood-based materials“)

Products which are listed on the criteria platform regarding the klima:aktiv house (www.baubook.at/kahkp) meet the requirements.

☐ **Wall and ceiling coats** are low in emissions. 5

Ceiling and wall coatings are used large-scale, therefore a reduction of pollutant content (especially of volatile organic compounds, which can cause fatigue, headache, irritation of mucous membranes, etc) is crucial.

The following limits for VOC content apply (Volatile Organic Compounds):

- Synthetic resin dispersions: max. 0.1 mass-% VOC (as contamination)
- Natural resin dispersions, which are preserved in-can with essential oils: max. 1 mass-% VOC under the condition that none of the oils used are classified as R43 (sensitizing)
- Dispersion-silicate paints (according to DIN 18363 definition) and dispersion whitewash can contain a maximum of 5 m.-% of other organic compounds

The criterium is generally met by means of glue colors, which are supplied in powder form, or if

walls are not painted.

Verification wall and ceiling coats

The valuation is based on the standard fitting offered by the developer.

- Austrian Eco-label UZ 17 wall colors
- German Blue Anel RAL UZ 102 low-emission wall colors
- „natureplus“ RL 0600 wall colors
- As an alternative, proof certificates, which were issued according to the criteria of one of the certificates mentioned above, are also affirmed.

Product which are listed on the criteria platform baubook regarding the klima:aktiv house (www.baubook.at/kahkp) meet the requirements. Proof is also accepted if glue colors only – supplied in powder form – are/were used, or if walls are not painted.

Measurements new buildings and in renovations with measures in interior finishing

Measurement sum VOC (Note: in the planning stage the target levels are specified!)

○ Sum VOC ≤ 300 µg/m³	10
○ 300 µg/m³ < Sum VOC ≤ 500 µg/m³	8
○ 500 µg/m³ < Sum VOC ≤ 1000 µg/m³	6
○ 1000 µg/m³ < Sum VOC ≤ 3000 µg/m³	2
○ Sum VOC > 3000 µg/m³ (source finding and source elimination required, TQB certificate cannot be issued.)	0
○ There is no sum VOC-measurement (only permitted for existing buildings and renovations without measures in interior fittings).	0

Verification measurement sum VOC

The measurement is carried out by an independent laboratory according to Austrian Standard ÖN M 5700.

The number of indoor pollutant measurements is defined for residential buildings as follows:

- Detached or two-family house: min. 1 room
- Row- or multi-family house with up to 25 residential units: min. 1 room
- Multi-family house 26 to 70 residential units: min. 2 rooms (uniform standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- Multi-family house 26 to 70 residential units: n*2 rooms (varied standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- For the other 70 residential units: additional 2 rooms (uniform standard fitting) or n*2 rooms (varied standard fitting in the main living areas)

Measurement formaldehyde
(Note: in the planning stage the target levels are specified!)

○ Formaldehyde ≤ 0.06 mg/m³ (Formaldehyde ≤ 0.05 ppm)	6
○ 0.06 mg/m³ < Formaldehyde ≤ 0.09 mg/m³ (0.05 ppm < Formaldehyde ≤ 0.075 ppm)	4
○ 0.09 mg/m³ < Formaldehyde ≤ 0.12 mg/m³ (0.075 ppm < Formaldehyde ≤ 0.10 ppm)	2
○ Formaldehyde > 0.12 mg/m³ (Formaldehyde > 0.10 ppm) (source finding and source elimination required, TQB certificate cannot be issued.)	0

○ There is no formaldehyde measurement (only permitted for existing buildings and renovations without measures in interior fittings).	0

Verification measurement formaldehyde

The measurement is carried out by an independent laboratory according to Austrian Standard ÖN M 5700.

The number of indoor pollutant measurements is defined for residential buildings as follows:

- Detached or two-family house: min. 1 room
- Row- or multi-family house with up to 25 residential units: min. 1 room
- Multi-family house 26 to 70 residential units: min. 2 rooms (uniform standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- Multi-family house 26 to 70 residential units: n*2 rooms (varied standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- For the other 70 residential units: additional 2 rooms (uniform standard fitting) or n*2 rooms (varied standard fitting in the main living areas)

Measurements in existing buildings
or for renovations without measures in interior fittings

When conducting a stock evaluation, only the existing stock can be evaluated. As there is often no information on the products used, the product reference is done instead by measuring VOC and formaldehyde rates.

Measurement sum VOC

The measurement is carried out by an independent laboratory according to Austrian Standard ÖN M 5700.

The number of indoor pollutant measurements is defined for residential buildings as follows:

- Detached or two-family house: min. 1 room
- Row- or multi-family house with up to 25 residential units: min. 1 room
- Multi-family house 26 to 70 residential units: min. 2 rooms (uniform standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- Multi-family house 26 to 70 residential units: n*2 rooms (varied standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- For the other 70 residential units: additional 2 rooms (uniform standard fitting) or n*2 rooms (varied standard fitting in the main living areas)

○ Sum VOC ≤ 300 µg/m³	24
○ 300 µg/m³ < Sum VOC ≤ 500 µg/m³	20
○ 500 µg/m³ < Sum VOC ≤ 1000 µg/m³	12
○ 1000 µg/m³ < Sum VOC ≤ 3000 µg/m³	0
○ Sum VOC > 3000 µg/m³ (source finding and source elimination required, TQB certificate cannot be issued.)	0
○ There is no Sum VOC-measurement.	0

Verification measurement sum VOC

The measurement is carried out by an independent laboratory according to Austrian Standard ÖN M 5700.

The number of indoor pollutant measurements is defined for residential buildings as follows:

- Detached or two-family house: min. 1 room

- Row- or multi-family house with up to 25 residential units: min. 1 room
- Multi-family house 26 to 70 residential units: min. 2 rooms (uniform standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- Multi-family house 26 to 70 residential units: n*2 rooms (varied standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- For the other 70 residential units: additional 2 rooms (uniform standard fitting) or n*2 rooms (varied standard fitting in the main living areas)

Measurement formaldehyde

The measurement is carried out by an independent laboratory according to Austrian Standard ÖN M 5700.

The number of indoor pollutant measurements is defined for residential buildings as follows:

- Detached or two-family house: min. 1 room
- Row- or multi-family house with up to 25 residential units: min. 1 room
- Multi-family house 26 to 70 residential units: min. 2 rooms (uniform standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- Multi-family house 26 to 70 residential units: n*2 rooms (varied standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- For the other 70 residential units: additional 2 rooms (uniform standard fitting) or n*2 rooms (varied standard fitting in the main living areas)

○ Formaldehyde ≤ 0.06 mg/m³ (Formaldehyde ≤ 0.05 ppm)	16	
○ Formaldehyde ≤ 0.06 mg/m³ (Formaldehyde ≤ 0.05 ppm)	11	
○ 0.09 mg/m³ < Formaldehyd ≤ 0.12 mg/m³ (0.075 ppm < Formaldehyde ≤ 0.10 ppm)	6	
○ Formaldehyde > 0.12 mg/m³ (Formaldehyde > 0.10 ppm) (source finding and source elimination required, TQB certificate cannot be issued.)	0	
○ There is no formaldehyde measurement.	0	

Verification measurement formaldehyde

The measurement is carried out by an independent laboratory according to Austrian Standard ÖN M 5700.

The number of indoor pollutant measurements is defined for residential buildings as follows:

- Detached or two-family house: min. 1 room
- Row- or multi-family house with up to 25 residential units: min. 1 room
- Multi-family house 26 to 70 residential units: min. 2 rooms (uniform standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- Multi-family house 26 to 70 residential units: n*2 rooms (varied standard fitting, e.g. floor covering (products), wall paint, etc. in the main living areas)
- For the other 70 residential units: additional 2 rooms (uniform standard fitting) or n*2 rooms (varied standard fitting in the main living areas)

D.2.3	Mold and moisture prevention / Pollutant inspection	10	0

New buildings
In the planning stage

☐ Site concept as means of avoiding water damages and moisture entry is in place	5	
☐ Drying periods are adhered to	5	
☐ There are no measures planned	0	

Verification planning

module lists; construction period plan, protective measures against water entry

After completion

☐ No noticable sources of mold in the interior	5	
☐ No water damages during the construction stage	5	

Verification completion

- Inspection of specific living areas and visual inspection (measurements, in cases of suspicions).
- Confirmation from construction firms verifying that there was no water or moisture damage during construction (in the case of damage, a damage report listing the damages, affected apartments and renovation measures taken, must be submitted).

EXISTING BUILDINGS AND RENOVATIONS

Inspection protocol in accordance with ÖN S 5730 „Surveying procedure for pollutants and other harmful substances in building structures“, measurements and appropriate renovation measures must be ordered, if there are any suspicions.
Mold and mold spore testing in accordance with the „Position paper on indoor mould“.

☐ Inspection of pollutants Schadstoffbegehung in compliance with ÖN S 5730 in existing buildings or measurements were conducted in cases of suspicion (this regards pollutants mold-spores, asbestos, PCB and PAK lead substance Benzo-(a)-Pyren, Biozide).	10	

Verification existing buildings

Inspection protocol in accordance with ÖN S 5730 „Surveying procedure for pollutants and other harmful substances in building structures“, measurements and appropriate renovation measures must be ordered, if there are any suspicions.
Mold and mold spore testing in accordance with the „Position paper on indoor mould“.

D.3	Sound insulation	50	0
D.3.1	Ambient noise	12	0

A-weighted enery long-term average sound level $L_{A,eq}$ (night):

○ $L_{A,eq}$ (night) ≥ 60 dB	0
○ 55 ≤ $L_{A,eq}$ (night) < 60 dB	3
○ 50 ≤ $L_{A,eq}$ (night) < 55 dB	6
○ 45 ≤ $L_{A,eq}$ (night) < 50 dB	9
○ $L_{A,eq}$ (night) < 45 dB	12

Verification

For A-weighted enery long-term average sound level $L_{A,eq}$ (night) – or if the day level is the more decisive rated value (e.g. industrial noise) - $L_{A,eq}$ (day): Classified as construction land category (see ÖAL directive No 36, Page 1), unless the monitored level is expected to be exceeded, due to existing noisesources (e.g. roads and rail traffic, air traffic, leisure facilities).

- Noise immission maps
- Area-specific calculations according to ÖN B 8115-2 or calculations based on strategic surrounding noise maps in accordance with ÖN B 8115-2 or measurements at the site according to ÖN S 5004

The area-specific decisive ambient noise level is also the base for measuring noise protection requirements of the outdoor construction materials and can be found in the building physics documents.

OR: A-weighted enery long-term average sound level LA,eq (day) – used if day level has a higher rated value (e.g. with industrial noise):

○ $L_{A,eq}$ (day) ≥ 70 dB	0	
○ 65 ≤ $L_{A,eq}$ (day) < 70 dB	3	
○ 60 ≤ $L_{A,eq}$ (day) < 65 dB	6	
○ 55 ≤ $L_{A,eq}$ (day) < 60 dB	9	
○ $L_{A,eq}$ (day) < 55 dB	12	

Verification

For A-weighted enery long-term average sound level $L_{A,eq}$ (night) – or if the day level is the more decisive rated value (e.g. industrial noise) - $L_{A,eq}$ (day):

- Classified as construction land category (see ÖAL directive No 36, Page 1), unless the monitored level is expected to be exceeded, due to existing noise sources (e.g. roads and rail traffic, air traffic, leisure facilities)
- Noise immission maps
- Area-specific calculations according to ÖN B 8115-2 or calculations based on strategic surrounding noise maps in accordance with ÖN B 8115-2 or measurements at the site according to ÖN S 5004

The area-specific decisive ambient noise level is also the base for measuring noise protection requirements of the outdoor construction materials and can be found in the building physics documents.

D.3.2	Acoustically effective layout	12	0

Staircase or elevator are not adjacent to bedrooms.
Applies to:

○ > 95% of residential units	2	
○ 80 - 95% of residential units	1	
○ < 80 % of residential units	0	

Noisy rooms (such as business, heating, other house technology rooms, rooms for garbage) are not adjacent to bedrooms.
Applies to:

○ > 95% of residential units	2	
○ 80 - 95% of residential units	1	
○ < 80 % of residential units	0	

Entrance doors do not lead from starecases or hallways directly to living rooms (no acoustically enclosed entrance halls).
Applies to:

○ > 95% of residential units	2	
○ 80 - 95% of residential units	1	

	○ < 80 % of residential units	0	
	On both sides of partition walls there are rooms which are used for same purposes (kitchen/kitchen, bedroom/bedroom). Applies to:		
	○ > 95% of residential units	2	
	○ 80 - 95% of residential units	1	
	○ 80 - 95% of residential units	0	
	On both sides of apartment partition ceilings there are rooms which are used used for same purposes (kitchen above kitchen, bedroom above bedroom). Applies to:		
	○ > 95% of residential units	2	
	○ 80 - 95% of residential units	1	
	○ < 80 % of residential units	0	
	Walls with plumbing installations are not adjacent to bedrooms. Applies to:		
	○ > 95% of residential units	2	
	○ 80 - 95% of residential units	1	
	○ < 80 % of residential units	0	
	Verification Submission plans, plans for execution (outlines, sections), house technology plans		
D.3.3	Noise protection of partition walls	12	0
	Multi-storey residential building		
	○ **New constructions/Renovation (incl. separating components):** $D_{nT,w}$ < 55 dB – notice that standard or BO (Bauordnung = building code) requirements are not met and visible building defects, which must be mended. OR: no measurement	0	
	○ 55 ≤ $D_{nT,w}$ < 56 dB	2	
	○ 56 ≤ $D_{nT,w}$ < 58 dB	4	
	○ 58 ≤ $D_{nT,w}$ < 61 dB	7	
	○ 61 ≤ $D_{nT,w}$ < 64 dB	9	
	○ $D_{nT,w}$ ≥ 64 dB	12	
	Town houses / Duplexes		
	○ **New buildings/Renovation** (incl. separating components): $D_{nT,w}$ < 60 dB - notice that standard or BO (Bauordnung = building code) requirements are not met and visible building defects, which must be mended. OR: no measurement **Existing buildings/Renovation** (excl. separating components): $D_{nT,w}$ < 60 dB OR: no measurement	0	

	○ 60 ≤ $D_{nT,w}$ < 61 dB	2	
	○ 61 ≤ $D_{nT,w}$ < 63 dB	4	
	○ 63 ≤ $D_{nT,w}$ < 66 dB	7	
	○ 66 ≤ $D_{nT,w}$ < 69 dB	9	
	○ $D_{nT,w}$ ≥ 69 dB	12	

Detached houses

	○ In free-standing detached houses requirements for protection against airbone noise of partition walls are not relevant; highest score. Coupled designs are classified as town houses or duplexes.	12	

Verification

Planning stage:
For massive construction elements verification is conducted according to ÖN B 8115-4. The calculation includes input data such as: the assessed sound insulation factor of building elements Rs,w und RF,w und Rf,w, improvement as a result of additional wall linings on the partition element and on every flanking transmission route KF,f and RFd and RDf, the junction point-insulation value for every junction points and every transmission path, the size of the lobby and the link-up period. For frame and wood constructions verification is carried out using the published Pro Holz (www.dataholz.com) or structural steel association catalogues, or calculations according to ÖN EN 12354-1 are used.

Construction:
The calculated weighted standard sound level difference $D_{nT,w}$ (C; Ctr) of one or several partition walls is classified in the construction certificate (calculations of the most common build-up(s) of a residential unit and unfavourable room situation(s) regarding noise transmission are used). Measurements are carried out at random, detailed statements regarding execution quality of each partition element canot be made.
The sound level difference is measured in third-octave bands of between 100 Hz to 3150 Hz, the weighted standard sound level difference constitutes a single value specification and is derived - in accordance with ÖN EN ISO 717-1 - from this data by averaging. It refers to a reverberation time of T0=0,5s at residential-like usage considering the weighted reverberation time.
Requirements for measurements: measurements should ideally be carried out towards the end of construction stage (acceptance measurements) and should document the actual utilization conditon.

Pre-measurement during the foundation work stage is recommended:

- Random measurement at the site for common partition elements according to ÖN EN ISO 140-4 and ÖN EN ISO 717-1
- Selection of apartments according to unfavourable spatial constellations (measurements in at least 5% of residential units must be submitted), if there are several measurements, a mean value from the point-system for individual assessments is used.

D.3.4	Noise protection of partition ceillings	12	0

Multi-storey residential building

New constructions/Renovation (incl. separating components): $D_{nT,w}$ < 55 dB – notice that standard or building code requirements are not met and visible building defects, which must be mended.
OR: no measurement

	○ Existing buildings/Renovation (excl. separating components): $D_{nT,w}$ < 55 dB OR: no measurement	0	

○ 55 ≤ $D_{nT,w}$ < 56 dB	2	
○ 56 ≤ $D_{nT,w}$ < 58 dB	4	
○ 58 ≤ $D_{nT,w}$ < 61 dB	7	
○ 61 ≤ $D_{nT,w}$ < 64 dB	9	
○ $D_{nT,w}$ ≥ 64 dB	12	

Detached/Semi-detached/town houses

○ Detached/Semi-detached/town houses without building physical rooted partition ceilings. The building is awarded the highest ratings by default for noise protection of partition walls.	12	

Verification noise protection

Planning stage:
For massive construction elements verification is conducted according to ÖN B 8115-4. The calculation includes input data such as: the assessed sound insulation factor of building elements Rs,w und RF,w und Rf,w, improvement as a result of additional wall linings on the partition element and on every flanking transmission route KF,f and RFd and RDf, the junction point-insulation value for every junction points and every transmission path, the size of the lobby and the link-up period.
For frame and wood constructions verification is carried out using the published Pro Holz (www.dataholz.com) or structural steel association catalogues, or calculations according to ÖN EN 12354-1 are used.

Construction:
Random measurement at the site for common partition elements according to ÖN EN ISO 140-4 and ÖN EN ISO 717-1

Selection of apartments according to unfavourable spatial constellations (measurements in at least 5% of residential units must be submitted), if there are several measurements, a mean value from the point-system for individual assessments is used.

D.3.5	Impact sound protection of partition ceilings	12	0

For multiple-storey buildings
weighted standard impact noise level $L'_{nT,w}$

New constructions/Renovation (incl. partition components): $D_{nT,w}$ < 48 dB – notice that standard or building code requirements are not met and visible building defects, which must be mended. OR: no measurement

Aim:
The goal is to provide protection against interfering impact sound transmission through partition elements between utilization units.
For the planning and construction assessment the weighted standard impact sound level LnT,w of the partition ceilings is used (for the most common or critical build-up(s) of a residential building). Calculations or measurements are carried out to determine sound transmission for unfavorable spacial constellations (large room to small room, displaced rooms, hallways above living rooms, maisonette staircase between units,...). Measurement(s) were taken randomly, detailed comments on execution quality of each partition element cannot be made.
In addition to classifying the weighted standard impact sound level, the following requirement applies: in low frequencies, the spectrum-weighted value C 50-2500 cannot cause an increase in the weighted standard impact noise level. If C 50-2500 ≥ 1 dB, the impact sound protection is rated lower by 1 point (compaired to C 50-2500 < 1 dB).
When rating the impact sound insulation, the reference curve causes interferences at low frequencies to be rated too low, and at high frequencies they are rated too high. This is because the course of the reference curve is based on an excitation of structure-borne noise by a tapping machine that has hard metal hammers.

To improve the assessment of common footstep sounds, a spectrum-weighted value for walking CI is introduced, which is determined in accordance with ÖN EN ISO 717-2.
Measuring results of Ln, L'_n oder L'_{nT} in third-octave bands within a frequency range of 100 to 2500 Hz, or in octave bands within a frequency range of 120 to 2500 Hz are added energetically to Ln,sum, $L'_{n,sum}$ oder $L'_{nT,sum}$.
Next, the spectrum-weighted value for walking is determined using the following equation:
$C_I = L'_{nT,sum}$ - 15 dB – $L'_{nT,w}$
(or analogue $C_I = L_{n,sum}$ - 15 dB – $L_{n,w}$ etc.).
Calculations to determine the spectrum-weighted value can also be carried out for a wider frequency range (incl. 50 Hz + 63 Hz + 80 Hz). The value is then referred to as $C_{I,50-2500}$ or $C_{I,63-2000}$. For assessing TQB the spectrum-weighted value $C_{I,50-2500}$ is used.

Measurement requirements: Measurements are ideally carried out at a later stage of construction (hand-over measurement) and should document the actual utilization condition, rugs/carpet floors/mats cannot be included; permanently used floor coverings can be incorporated.
Residential buildings: Classification of partition elements applies new constructions and renovations, in which the partition ceilings are affected by the renovation. For existing buildings and renovations, which do not affect indoor elements, measurement can be presented and a classification according to the new construction scheme can be carried out. If no measurement is taken, the minimum requirement ($L'_{nT,w}$ <= 46 dB(A)) is not met (0 points in the evaluation).

○ Existing buildings/Renovation (excl. partition components): $D_{nT,w}$ < 48 dB or: no verification/measurement	0	
○ 46 < $L'_{n,Tw}$ ≤ 48 dB(A) with $C_{I,50-2500}$ ≥ +1 dB	1	
○ 46 < $L'_{n,Tw}$ ≤ 48 dB(A) with $C_{I,50-2500}$ < +1 dB	2	
○ 43 < $L'_{n,Tw}$ ≤ 46 dB(A) with $C_{I,50-2500}$ ≥ +1 dB	3	
○ 43 < $L'_{n,Tw}$ ≤ 46 dB(A) with $C_{I,50-2500}$ < +1 dB	4	
○ 41 < $L'_{n,Tw}$ ≤ 43 dB(A) with $C_{I,50-2500}$ ≥ +1 dB	5	
○ 41 < $L'_{n,Tw}$ ≤ 43 dB(A) with $C_{I,50-2500}$ < +1 dB	6	
○ 39 < $L'_{n,Tw}$ ≤ 41 dB(A) with $C_{I,50-2500}$ ≥ +1 dB	7	
○ 39 < $L'_{n,Tw}$ ≤ 41 dB(A) with $C_{I,50-2500}$ < +1 dB	8	
○ 37 < $L'_{n,Tw}$ ≤ 39 dB(A) with $C_{I,50-2500}$ ≥ +1 dB	9	
○ 37 < $L'_{n,Tw}$ ≤ 39 dB(A) with $C_{I,50-2500}$ < +1 dB	10	
○ $L'_{n,Tw}$ ≤ 37 dB(A) with $C_{I,50-2500}$ ≥ +1 dB	11	
○ $L'_{n,Tw}$ ≤ 37 dB(A) with $C_{I,50-2500}$ < +1 dB	12	

Detached/Semi-detached/town house

○ Detached/Semi-detached/town house without building physical rooted partition ceilings. Requirement is met.	12	

Verification

- **Planning phase:** building physics calculation proof according to ÖN EN 12354-2
- **Construction:** random measurement at site for common partition element(s) in accordance with ÖN EN ISO 140-7 and ÖN EN ISO 717-2
- **Selection of apartments** according to unfavourable spatial constellations (measurements in at least 5% of residential units must be submitted), if there are several measurements, a mean value from the point-system for individual assessments is used.

D.3.6	Measurement of external facade, basic indoor noise level (night) or noise level of ventilation system	12	0

In PLANNING CASES: Calculation value $R'_{res,w}$

Detailed proof (calculated weigthed noise insulation-rate $R'_{res,w}$ for critical rooms) is presented, standard requirements in accordance to ÖN B 8115-2 are met.

○ For new constructions/renovations: Detailed proof (calculated weigthed noise insulation-rate $R'_{res,w}$ for critical rooms) is presented, standard requirements in accordance to ÖN B 8115-2 are met.	12	

For IMPLEMENTATION / EXISTING BUILDINGS:

Residential buildings with window ventilation
A-weigthed basic level $L_{A,95}$ at night (=basic noise level) in bedroom

○ $L_{A,95}$ (night) > 20 dB(A) or no measurements are presented	0	
○ 19 dB(A) < $L_{A,95}$ (night) ≤ 20 dB(A)	2	
○ 18 dB(A) < $L_{A,95}$ (night) ≤ 19 dB(A)	4	
○ 17 dB(A) < $L_{A,95}$ (night) ≤ 18 dB(A)	6	
○ 16 dB(A) < $L_{A,95}$ (night) ≤ 17 dB(A)	8	
○ 15 dB(A) < $L_{A,95}$ (night) ≤ 16 dB(A)	10	
○ $L_{A,95}$ (night) ≤ 15 dB(A)	12	

OR: Residential buildings with window ventilation
A-weigthed basic level L_A, 95 at night (=basic noise level) in bedroom

In this case the basic noise level in the bedroom should be increased by not more than 3 dB(A), by operating the system. Assessment of steady ventilation sound is carried out according to the following scaling. Both the A-assessment and the C-weighted noise level are used, which should not exceed 20 dB between 63 and 4000 Hz in the worst case, and not be more than 12 dB above the A-weighted ventilation noise level.

○ $L_{A,eq,nT}$ (night) > 25 dB(A) or no measurements are presented	0	
○ 22 dB(A) < $L_{A,eq,nT}$ (night) ≤ 25 dB(A) and $L_{C,eq,nT}$ (night) ≤ 42 dB(C)	2	
○ 20 dB(A) < $L_{A,eq,nT}$ (night) ≤ 22 dB(A) and $L_{C,eq,nT}$ (night) ≤ 42 dB(C), max. 20 dB above $L_{A,eq,nT}$ (night)	4	
○ 20 dB(A) < $L_{A,eq,nT}$ (night) ≤ 22 dB(A) und $L_{C,eq,nT}$ (night) ≤ 40 dB(C), max. 18 dB above $L_{A,eq,nT}$ (night)	6	
○ 18 dB(A) < $L_{A,eq,nT}$ (night) ≤ 20 dB(A) und $L_{C,eq,nT}$ (night) ≤ 38 dB(C), max. 18 dB above $L_{A,eq,nT}$ (night)	8	
○ 18 dB(A) < $L_{A,eq,nT}$ (night) ≤ 20 dB(A) and $L_{C,eq,nT}$ (night) ≤ 36 dB(C), max. 16 dB above $L_{A,eq,nT}$ (night)	10	
○ $L_{A,eq,nT}$ (night) ≤ 18 dB(A) and $L_{C,eq,nT}$ (night) ≤ 38 dB(C), max. 20 dB above $L_{A,eq,nT}$ (night)	12	

Verification

In the planning certificate:

- If the inspection of the exterior facade's noise insulation measurement is conducted according to the ÖN B 8115-2 standard requirements (weighted noise insulation rate R'res,w depends on decisive ambient noise level für most critical rooms). The building physics calculations are the basis for submission and execution planning.

For the construction certificate the following measurements need to be carried out:

- Residential buildings with window ventilation in bedrooms: basic noise level = A-weighted basic level $L_{A,95}$ at night (8-hour measurement, period 22:00 to 6:00 o'clock)

Measurement should be taken in the (bed)rooms which are most exposed to noise (rooms with high percentage of glazing), the noisiest half hour within the measurement period is used as the basis for the TQB assessment (according to ÖN S 5104).

- Residential buildings with mechanical ventilation and/or outgoing ventilation system (with/without heat recovery) in the bedrooms: the noise level $L_{A,eq,nT}$ and $L_{C,eq,nT}$ are measured while ventilation is in use.

Measurement requirements: night-time measurement, ventilation runs on basic setting, at least 3-4 different measurement points per room, min. 10-minute measurement, ventilation is switched on and off several times between measurements, measurement data collected during normal operation). Measurement values $L_{A,eq}$ must be compared during this period with the value for $L_{A,95}$ and $L_{A,50}$ (to detect noise, e.g. slammed car door); $L_{A,eq}$ should not exceed $L_{A,9}$ by more than 1-2 dB, and should be max. 1 dB above $L_{A,50}$ (otherwise the values must be discarded), relevant measurement values are weighted according to reverberation time.

D.4	Daylight and sunlight	50	0
D.4.1	Daylight factor	25	0
	○ No verification for daylight factor	0	
	○ Selective daylight factor ≥ 2 % for < 25% of residential units	0	
	○ Selective daylight factor ≥ 2 % for 25 to < 40 % of residential units	5	
	○ Selective daylight factor ≥ 2 % for 40 to < 55 % of residential units	10	
	○ Selective daylight factor ≥ 2 % for 55 to < 70 % of residential units	15	
	○ Selective daylight factor ≥ 2 % for 70 to < 85 % of residential units	20	
	○ Selective daylight factor ≥ 2% in 85 % plus of residential units	25	

Verification

The day light factor D is determined as follows: in a working plane (e.g. 0.85 m above floor top), the indoor horizontal illumination level E_p is measured, which is then compared to the outdoor horizontal illumination level E_a when the sky is evenly cloudly (i.e. no direct sunlight), unspoilt hemisphere and snow-free surroundings.

$D = E_p / E_a \times 100$ (in percent)

The areas of both illumination levels affected by direct sunlight are not part of the calculation. The daylight factor varies from one spot in the room to the other, however, it defines a constant and thus geometry-related dimension, in the case of cloudy skies and unchanged reflection ratios. The sum of daylight factors of all points of a usable surface are the basis for the mean daylight factor of a room. A range of daylight factors – so-called daylight light-section – provide information about the impact of light openings on indoor lighting. For a simplified verification, a selective daylight factor is used to assess main living areas.
Verification:
The selective daylight factor is calculated or measured at a 2-meter distance from the window and

a 1-meter lateral distance from the wall, in a usable surface of 0.85 m above the floor top.
Categories of comparable tops are calculated – for the largest living area, respectively.

- Planning: Calculations (using validated computer programs, e.g. Relux, Primero, Adeline, Superlite, Radiance...)
- Construction: random measurements at site (using Luxmeter) in main living areas

D.4.2	Direct sunlight during winter	25	0
	○ No proof for sunlight during the winter	0	
	○ Min. 1.5 sunny hours on Dec 21 <25% of residential units	0	
	○ Min. 1.5 sunny hours on Dec 21 in 25 of <40% of residential units	5	
	○ Min. 1.5 sunny hours on Dec 21 in 40 of <55 % of residential units	10	
	○ Min. 1.5 sunny hours on Dec 21 in 55 of <70 % of residential units	15	
	○ Min. 1.5 sunny hours on Dec 21 in 70 of <85 % of residential units	20	
	○ Min. 1.5 sunny hours on Dec 21 in at least 85% of residential units	25	

Verification

- **Planning:** submission and execution plans, calculations using programs (e.g. Horizon, Solrad, Relux...) or determining horizon heightenings in a solar way diagram
- **Construction:** measurements of horizon heightenings by means of Heliochron and presentation of achieved sunlight hours on Dec 21 on a solar way diagram of the site.

E	Resource efficiency	200	0
E.1	Avoidance of critical material	50	0
E.1.1	Avoidance of CFC	15	0
	☐ The insulating material used is free of CFC.	5	
	☐ The expanding foam used is free of CFC.	5	
	☐ The coolants used are free of CFC or no coolants are used at all.	5	
	☐ In the building insulating material, expanding foam or coolants containing CFC are used.	0	

Verification

- Proof that product is free of CFC: Declaration of product on the internet platform baubook or confirmation by manufacturer.
- Documentation by means of delivery slip or invoice indicating the product name and confirmation of products used issued by the manufacturer or the chief worker.
- For heat insulating material the criterion is considered fulfilled if, among other things, it boasts the Austrian eco-labelling (Guideline UZ 43).

E.1.2	Avoidance of PVC	35	0
	☐ PVC-free water and waste water pipes in the building (underground PVC pipes are allowed)	4	
	☐ PVC-free supply and exhaust air pipes (if no such pipes are used, this criterion is considered fulfilled)	4	
	☐ PVC-free electrical installation material (cables, wiring, pipes, outlets etc.)	8	
	☐ PVC-free sealing sheets, foils	4	
	☐ PVC-free floor coverings (also as composite material e.g. in cork floorings, carpets etc.) including skirting boards	4	
	☐ PVC-free wallpapers or no wallpapers planned	4	
	☐ PVC-free windows	8	
	☐ PVC-free doors	4	
	☐ PVC-free shutters	4	
	☐ None of the above mentioned criteria apply	0	

Verification

- Documentation by means of delivery slip or invoice indicating the product name and confirmation issued by manufacturer.
- Manufacturer’s declaration on the internet platform baubook.
- For plastic pipes the criterion is met, among other things, by installing wastewater pipes which are certified according to the Austrian Eco Label Guideline UZ 41 - Kanalrohre aus Kunststoff (Plastic sewage pipes).
- For floor coverings the criterion is met, among other things, by installing coverings which are certified according to the Austrian Eco Label Guideline UZ 56 - Bodenbeläge (Floor coverings).
- Existing buildings: On-site inspection

E.1.3	Avoidance of VOC (except for use in interior construction - D.2.2)	5	0
	○ The bitumen undercoat, coat and adhesives used are solvent-free.	5	
	○ Or: No bitumen undercoat, coat and adhesives are used.	5	

	○ Bitumen undercoat, coat and adhesives are not solvent-free.	0	

Verification:

- Product data sheets referring to Giscode BBP10.
- Manufacturer's declaration on the internet platform baubook.
- The criterion is considered fulfilled if no bitumen undercoat, coat and adhesives are used.

E.2	Regionality, recycling share, certified products	50	0
E.2.1	Regionality	20	0

Regionality of transport distance – New building, renovation

Sample calculation:
Building material 1 making up 25% of the entire building mass is delivered over a distance 120 km, building material 2 making up 15% of the building mass is delivered over a distance of 290 km, building material 3 making up 5% of the building mass is delivered over a distance of 45 km. The share of the three building materials in the total mass is 45%, the mass-weighted distance is (120*0.25 + 290*0.15+ 45*0.05)/0.45 = 168 km (= 10 points). If building material 3 is delivered over more than 300 km, the result is zero points.
The most "mass intensive building materials" are those which make up the largest part of the mass in the building. Usually, these are the statically load-bearing elements of the building. Basements are included in the evaluation. With regard to the distances covered, only the transport done by truck is considered (transport by rail/ship is not included in the sum of distances, i.e. when rail transport makes up 100% of all transport from the production to the construction site the full points are awarded; in case of e.g. 20% of truck transport and 80% of rail transport only the part done by truck is considered.)
With regard to in-situ concrete, the transport route of the ingredients is taken into account, with floor fill the transport route of the floor fill sand is considered.

○ The mass-weighted distance between construction site and production site of the three most mass-intensive building materials is no more than 100 kilometres with none of the building materials being transported over more than 300 kilometres by means of trucks.	20	
○ The mass-weighted distance between construction site and production site of the three most mass-intensive building materials is between 100 and 200 kilometres with none of the building materials being transported over more than 300 kilometres by means of trucks.	10	
○ The mass-weighted distance between construction site and production site of the three most mass-intensive building materials is between 200 and 300 kilometres with none of the building materials being transported over more than 300 kilometres by means of trucks.	5	
○ The mass-weighted distance between construction site and production site of the three most mass-intensive building materials is more than 300 kilometres.	0	

Verification

- Documentation of the most mass-intensive building material or components: mass and mass fraction in the building, production site, distance between production and construction site.
- If applicable, proof of the transport by rail has to be furnished.

Evaluation of existing buildings

Existing buildings which are more than five years old automatically get the highest rating in this category as no more pollution is possible from the construction zone and proof can be hard to furnish.

	☐ The existing building is more than five years old and a detailed determination of mass is no longer affordable.	20	

Verification

- With existing buildings: proof that this building is at least 5 years old

E.2.2	Use of recycling material	15	0
	○ Use of recycled or reclaimed/reused building material in mass percentage of total mass greater than 25%	15	
	○ Use of recycled or reclaimed/reused building material in mass percentage of total mass between 15 and 25%	10	
	○ Use of recycled or reclaimed/reused building material in mass percentage of total mass is 5 and less than 15%	8	
	○ Use of recycled or reclaimed/reused building material in mass percentage of total mass less than 5%	5	
	○ No use of recycled or reclaimed/reused building material	0	

Verification

The total mass of the object (thermal building envelope, subceilings, interior walls, buffer room, basements, underground carparks, etc.) is analysed. In case of renovations superstructures remaining in the construction are considered as reused building material. In the field of new construction and renovation the goal is to use building products with a large degree of recycling or to reuse useful and high-quality building material/building constructions to minimise the use of new resources as well as the effort for disposal and landfill. The renovation sector offers great savings potential while retaining the existing structure as much (and reasonably) as possible.

- Mass calculation of building material with a large degree of recycling as well as reclaimed or reused building material.
- Submittal of the calculation results proving the recycling share by the manufacturers (when using recycling building material; e.g. data sheets) or construction companies/planners (when keeping parts of the building).

E.2.3	Use of products with environmental certificates	30	0
	In the exterior walls there are... products with environmental certificates and a share of the area of at least 80%:		
	○ no products	0	
	○ one product	3	
	○ two products	6	
	○ three products or the exterior wall contains only products with environmental certificates	8	
	In the interior walls/partition walls there are... products with environmental certificates and a share of the area of at least 80%:		
	○ no products	0	
	○ one product	3	
	○ two products	6	
	○ three products or the interior wall/partition walls contain only products with environmental certificates	8	

In the subceilings/partition ceilings there are... products with environmental certificates and a share of the area of at least 80%:

○ no products	0
○ one product	3
○ two products	6
○ three products or the subceilings/partition ceilings contain only products with environmental certificates	8

In the roof structures/top ceilings there are... products with environmental certificates and a share of the area of at least 80%

○ no product	0
○ one product	3
○ two products	6
○ three products or the roof structures/top ceilings contain only products with environmental certificates	8

In the foundation slab/basement ceiling there are... products with environmental certificates and a share of the area of at least 80%

○ no product	0
○ one product	3
○ two products	6
○ three products or the foundation slab/basement ceiling contain only products with environmental certificates	8

Verification

Points are awarded for up to three building materials which make up at least 80% of the area of the following building components. If the building component consists of less than three building materials and if all building materials of the component were checked, the maximum number of points per component is awarded as well.

- Exterior walls
- Interior walls/partition walls
- Subceilings/partition ceilings
- Roof/top ceiling
- Foundation slab/basement ceiling

Verification:

- Points are awarded for products with the following eco labels: natureplus, IBO certificate, Austrian Eco Label, others on request
- For more information please see www.baubook.info , www.natureplus.org, www.ibo.at, www.umweltzeichen.at.
- Test certificates or listings of the respective products on the website of the certification bodies have to be supplied.
- Indication as to the area or share in the relevant building components (planning documents, area extract).

E.3	Eco-efficiency of entire building	60	0

E.3.1	OI3 Calculation as leading indicator for the eco efficiency of the building	60	0

Eco-efficiency within the life cycle based on the OI3 index 60

The quality criteria for the eco-efficiency of the complete building within the life cycle (or the materials used in the building) are calculated by using the OI3 indicator (here: $OI3_{BG3,BZF}$). Within a life cycle analysis of 100 years it includes all superstructures available in a given building as well as all materials used.

Out of the wealth of environmental categories or properties, the OI3 index uses the following three:

- Greenhouse potential (for 100 years, as of 1994)
- Acidification potential
- Consumption of non-renewable energetic resources

Definitions: see [OI3-Leitfaden 2010]

The ecological production effort for a building with the current building standard is about the same as the ecological effort for heating a passive house for 100 years. Therefore the ecological optimisation of the production effort forms an essential part of ecological building activities. Ecological optimisation in this context refers to minimising the flow of material, the energy input and the amount of emissions during the production of the building and the building material used. Nowadays not only the date of construction is taken into account but also the maintenance cycles during the entire life of a building which are necessary depending on the useful life of the construction used are considered.
The ecological choice of building material should be based on scientific or at least reproducible aspects. Quantitative methods such as the method of effect-oriented classification allow for a pretty objective comparison of building materials. Among other things, this method calculates the ecological key figures regarding global warming potential or acidification potential. One should keep in mind, though, that the ecological effect categories only cover some of the effects building materials may have during their entire life cycle. In order to evaluate for example the health hazards during integration and use, additional information and evaluation criteria are necessary (e.g. whether the products used are free of emissions and pollutants, etc.).

The lower the share of non-renewable energy and the lower the share of greenhouse gas and other emissions during the production of the building material and the building at the time of construction as well as during the necessary renovation and maintenance activities, the lower the value of the OI3 index of a building.

Expansion of system boundaries: Previously, the OI3 index of a building was mainly calculated for the thermal building envelope at the time of construction ($OI3_{TGH,BGF}$). In the context of the life cycle evaluations this boundary was expanded deliberately:

- BG0 (former thermal building envelope boundary): Construction of thermal building envelope + subceilings – roofing – moisture proofing – rear-ventilated parts of the front
- BG1: thermal building envelope (constructions in their entirety) + subceilings (constructions in their entirety)
- BG2: BG1 + interior walls relevant from a building physics point of view + buffer rooms without interior components
- BG3: BG2 + interior walls in their entirety + buffer rooms in their entirety (e.g. unheated basement)
- BG4: BG3 + direct development (open staircases, open pergolas, etc.)
- BG5: BG4 + building services
- BG6: BG5 + development in its entirety + annexes

Starting with system boundary BG2, the time-related system boundary can already contain the constructions' useful life. As of system boundary BG3, the useful life must be defined for the component layers as otherwise the unheated basement in particular in single-family houses will be ecologically "overrated". System boundary BG5 refers to the building in its entirety. System boundary BG6 already refers to building complexes.
The TQB evaluation uses system boundary BG3. For system boundary BG3 not only the first construction is taken into account but also the useful life and the necessary renovation and maintenance cycles of the component layers during the entire life cycle of a building are considered. According to ÖN EN 15804, the standardised evaluation period is assumed to be 100

years.

Renovation and evaluation of existing buildings:
For the time being, when drawing up a balance of renovations the existing building is evaluated like a new building that has not yet been built. This generates an environment balance which results in the symbolic (fictitious) book value of the object in case of a new construction of an equivalent building (on the same planning and legal base as the existing object) in year 1. When then taking into account the remaining life of the building or its components the constructional-technical state of the individual components is considered: The evaluation estimates the remaining life of the existing components and analyses in which areas how many exchange cycles are to be expected. Indirectly, components with a particularly long life benefit from this method: For example a late 19th century building which is due for renovation can thus considerably expand the actual evaluation cycle over the 100-year life cycle assumed for new buildings: If at the time of the planned renovation this object e.g. has already been in existence for 120 years and the renovation aims at prolonging the life by an additional 30 years, the balanced life cycle of the components affected is increased by 50 years compared to “normal” new building. In the new evaluation of the renovation only those components are considered as “completely new investments” which have been exchanged and/or added to in the course of renovation. The exchange cycles of all components have to be estimated regarding the expected remaining life of the building. From what is known from the documentation of previous renovation measures, actual or estimated values can be used. Components with a particularly long life receive a better evaluation in relation to shorter-lived components with shorter exchange cycles. Renovation projects thus generally receive better evaluations than new buildings of the same design.

$OI3_{BG3,BZF}$

Verification

- OI3 calculation and documentation of validated EDP programs (e.g. EcoSoft (implemented already); Ecotech-Build Desk, Archiphysik, GEQ-Zehentmayer; (implementation being prepared))
- In addition to the OI3-Indikator the full range of environmental indicators (regarding to CEN TC350) is documented without earning credits in the system

Sources

1. [OI3-Leitfaden, 2010] OI3-Indikator: IBO-Leitfaden für die Berechnung von Ökokennzahlen für Gebäude, IBO GmbH, Stand Februar 2010, V.2.2 , IBO Eigenverlag, Wien [www.ibo.at]
2. [ÖN EN 15804] ÖNORM EN 15804 (Normentwurf) (2008-06-01) Nachhaltigkeit von Bauwerken - Umweltdeklarationen für Produkte - Regeln für Produktkategorien

E.4	Disposal	60	0
E.4.1	Disposal indicator	60	0
	Disposal indicator EI	60	

With some 6.6 million tons, building industry waste forms a major part of the total waste in Austria (second-largest portion after earth excavation, app. 20% of the total waste without earth excavation).
This kind of waste, however, has a great utilisation potential which is still largely unused. At the same time the construction industry is the economic area with the biggest stock and the largest material input required (of some 40%). The goal is to ensure good disposal properties of building materials and constructions or of buildings. The quality points are awarded based on the disposal indicator. The disposal indicator (EI) of the building can be calculated together with the OI3 index and forms a volume of the building material or components used in the object weighted by disposal and recycling properties.
The disposal indicator EI developed within the framework of a joint research project of IBO and Österreichisches Ökologie-Institut is used in the same way already when evaluating klima:aktiv non-residential buildings. The disposal index (EI) of the building can be calculated together with the OI3 index and forms a volume of the building material or components used in the object

weighted by disposal and recycling properties. The system boundary for the disposal index of the building is the same as for the $OI3_{BG3,BZF}$, for the time being however without windows and doors. Rear-ventilated constructions must be taken into account. The EI of a building is the area-weighted mean value of the disposal indices of the constructions (EIKon). Every component within the system boundary is evaluated in several steps:

1. Calculation of the accruing volume
2. Weighting related to the disposal rating of the building materials
3. Weighting related to the utilisation potential of the building materials
4. Addition of building material results
5. Consideration of waste fractions

From the EI_{Kon} the EI of the building is calculated by means of weighted averaging.

1. Calculation of the accruing volume

- For every material used in the component the volume for disposal is calculated. These criteria are based on the theory that the ecological disposal effort is higher if the accruing amount is higher and that in many areas of disposal (storage, transport, landfill) the volume is the determining factor. The accruing amount is indicated in cubic meter. All amounts accrued over the evaluation period of 100 years are considered (“aggregate volume”), e.g. an insulating board with a thickness of 10 cm and a useful life of 40 years causes 0.1 m^2 * 100 / 40 = 0.25 m^3 insulating material per meter of component.
- All materials that are also included in the calculation of the ecological parameters for the production are taken into account.

2. Weighting related to the disposal rating of the building materials
The volume accrued for each material of the component is multiplied by the disposal rating of the material, i.e. for a building material with disposal rating 3 the threefold waste volume is calculated (e.g. 0.25 m^3 cellulose fibre flakes with disposal rating 3 result in a “weighted” volume of 0.75 m^3).

3. Weighting related to the utilisation potential of the building materials
The utilisation potential of the building materials reduces the amount of waste to be eliminated. This is based on the following assumptions:

utilisation potential	waste
1	25 %
2	50 %
3	75 %
4	100 %
5	125 %

The table can be interpreted as follows: From a building material with a utilisation potential of 1 there is only 25% waste; 75% is recycled etc. For the elimination of a building material with a utilisation potential of 5 additional material is needed for the processing which increases the amount of waste by 25% (125%).

4. Addition of building material results
The total of all building material volumes of a component weighted this way results in the material-related disposal rating of that component.

5. Consideration of the number of fractions
The criteria are based on the theory that the likeliness of a high-level disposal of building waste increases with the increased share of any one waste material fraction. The building materials are thus attributed to the three fractions “organic”, “mineral” and “metallic”, which differ fundamentally with regard to their way of disposal. If the entire component basically consists of only one fraction (≥ 95%), the disposal rating of that component is decreased by 0.1.

Disposal indicator:

Verification

- Calculation and documentation of the disposal rating by using the program EcoSoft_Entsorgung in the start phase (later also with the programs Ecotech-Build Desk, Archiphysik, GEQ-Zehentmayer).
- At http://www.ibo.at/de/produktpruefung/index.htm you can request the program from the IBO (Österreichisches Institut für Bauen und Ökologie). The program EcoSoft_Entsorgung contains a building material table with suggestions for the disposal rating and the utilisation potential. These values must be adjusted individually depending on the form of installation of the building materials.