Buildwise Magazine

Building envelope edition

Mar-Apr 2025

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Building 2030 Together

The Belgian construction sector is at the start of a major transformation. For the first time, we are working together – under the leadership of Buildwise – to formulate a global sectoral plan. This plan transcends the individual ambitions of a single organisation: it reflects a truly collective effort that will mobilise the whole sector.

To create a more collaborative approach for the end clients, a number of sector organisations have taken the lead: from contractors, installers and architects to consultancy and engineering firms, material manufacturers and research centres. It is our responsibility to help building professionals with this transformation by harmonising our practices and services and strengthening our collaboration. Buildwise will play an essential role in this by promoting trust and dialogue between all parties.

Just as it is with every building or renovation project, collaboration is the key to a more resilient and effective sector. By joining forces, we can reconcile economic ambitions with ecological requirements. At the heart of this initiative are three major societal challenges, each with a direct impact on construction:

- **sustainability:** construction with respect for people and the planet
- **profitability:** increase productivity and guarantee economic feasibility
- **affordability:** strengthen the position of construction professionals and offer clients affordable solutions at the same time.

To address these challenges, the sector is focusing on three strategic pillars that define our joint ambitions.

1. Join forces

- Position the construction sector as the driving force for sustainability.
- Promote trust between the different parties.
- Develop a robust and sustainable ecosystem that creates value for everyone, from professionals to clients.

Sofie Oosterlinck,
Chief Strategy Officer

2. Make innovation accessible

- Transform the sector into an efficient driver for innovation.
- Continue to implement data management and digitalisation.
- Improve the profitability and productivity of building professionals.

3. Create value for the client and the sector

- Make the sector an attractive employer.
- Help create buildings and infrastructures that are both affordable and sustainable.
- Stimulate the development of new markets.

Our joint commitment to societal challenges and ambitions puts our sectoral plan firmly on track. This project will continue to develop in the coming years thanks to **close collaboration between sector organisations and partners from across the construction chain**. Each party is committed to implementing concrete initiatives to help our sector advance.

Go to the 'Ambitions' page on our website to find out how we are working together on the future of the construction sector.

Wooden floors above crawl spaces: how do you prevent damage?

When installing a wooden floor above a crawl space or basement, it is essential to have a well-thought-out design in order to prevent moisture damage. Buildwise points out the importance of constructing the floor caisson correctly, ventilating the crawl space properly and maintaining sufficient height above ground level.

A. Skowron, Buildwise

Timber frame construction remains attractive thanks to its many benefits, especially in terms of sustainability and energy performance. However, certain techniques such as installing wooden floors above crawl spaces or basements bring specific challenges which need to be anticipated from the design phase. Failure to do so can lead to damage that compromises the sustainability of the structure. Chapter 6 of Technical Information Note 291 (TIN 291) provides a number of specific recommendations on how to avoid these risks.

At your own risk...

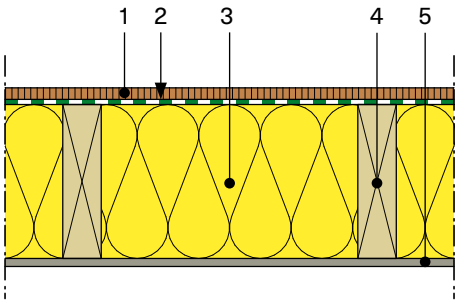
It is important to emphasise that Buildwise advises against installing a wooden floor above a crawl space on account of the risks of humidification and deterioration in the long term and the strict requirements for ventilation openings, especially above a crawl space where inspection is even more difficult to carry out.

Construction of a wooden floor above a crawl space that does not comply with the recommendations from TIN 291.

Composition of the floor caisson

The floor caisson consists of a number of elements that are essential for the building's sustainability and thermal comfort (see figure 1). This structure consists of, from top to bottom:

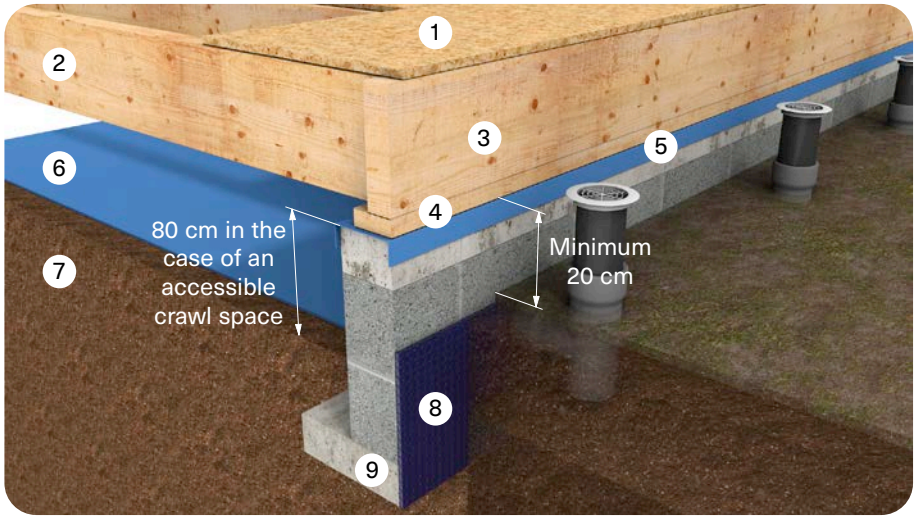
- a **sheet**, often wood-based (OSB, plywood) with a minimum climate class 3 (*), to secure the bracing



1. Sheet
2. Damp proofing
3. Water-repellent thermal insulation
4. Supporting beam
5. Base board of the caisson

1 Composition of a floor caisson.

(*) A **climate class** is a standardised classification (according to NBN EN 1995-1-1) based on the moisture content of the wood as a function of the moisture and temperature conditions expected during use. A **use class** is a standardised classification (according to NBN EN 335) that defines the risk of exposure to moisture and biological agents. Appendix A to NBN EN 335 describes the consistency between these two classifications.



1. Sheet
2. Supporting beam
3. Ring beam
4. Levelling member if present
5. Moisture barrier
6. Plastic sheeting
7. Ground level
8. Seal
9. Foundations

2 Minimum height between ground level and a wooden floor above a ventilated crawl space.

- **damp proofing and water-repellent thermal insulation** to restrict moisture and heat transport. The insulation should be gently compressed (with an overwidth of 5 to 20 mm depending on the density). If the damp proofing (S_d value ≥ 18 m) is between a non-heated volume and a heated volume, it should be installed on the warm side of the floor
- **supporting beams** dimensioned to absorb loads during use. They should have natural durability or be given a preservation treatment appropriate for use class 3
- a **base board** that usually holds the insulation in place. That board (e.g. made of fibre cement) should be moisture-resistant (climate class 3), rodent-proof and form a sufficient water vapour screen but the S_d value should be lower than that of the damp proofing installed on the warm side.

Connection to the foundations: a critical point

The wooden floor should be supported by foundations dug to a sufficient depth, with a **moisture barrier** (e.g. an EPDM membrane) in between to prevent capillary rising damp (see figure 2, no. 5).

For good structural continuity between the floor and the foundations, the floor should be anchored using metal connectors made of stainless steel (provided with stainless steel screws).

Ventilation of the underside of the floor

Ventilation of the crawl space is often underestimated but is crucial for preventing moisture accumulation and thus also the formation of mould or wood rot. TIN 291 recommends the following measures:

- providing **ventilation openings in opposite façades** for optimum air circulation. The total area of those openings should be at least equivalent to 1/150th of the floor area
- **optimal positioning of the openings** designed to avoid zones where air could stagnate
- possibly installing **mechanical ventilation**, especially with high groundwater levels, with a minimum hourly change rate of half the total air volume in the crawl space.

Proper dimensioning of the ventilation system is crucial to limit the risk of internal condensation and thus guarantee the sustainability of the wooden structure.

It is recommended to put down **plastic sheeting** on the floor of the crawl space to limit evaporation (see figure 2, no. 6). To improve the durability of that sheeting, we recommend putting a layer of gravel on top to stop rodents and other vermin from tearing it apart.

Minimum height above ground level

Wooden floors should be installed at a minimum height above ground level in order to prevent direct contact with ground moisture. According to TIN 291, the floor should be at least 20 cm above ground level (see figure 2). For an accessible crawl space, a minimum height of 80 cm is recommended between the floor of the ventilated crawl space and the underside of the first wooden element that is laid on the foundations (e.g. levelling member). For a non-accessible crawl space, that minimum height is 45 cm.

This article was produced within the framework of the Standards Antenna 'Structural Eurocodes' subsidised by NBN.

How do you choose the right lime mortar?

Lime mortars are often used in the restoration of heritage buildings. They are also becoming increasingly popular in new construction projects because they would be more suitable if the brickwork was to be dismantled at a later date (circularity, reuse). However, it is essential to choose materials based on their exposure to weather conditions.

Y. Grégoire, Y. Vanhellemont, Buildwise

The realisation of masonry and jointing mortars is described in Technical Information Notes (TIN) 271 and 297 respectively. In our regions, only cement and bastard mortars (cement-lime) are recommended for external applications. That is because the durability of a mortar where the binder consists of pure air lime cannot be guaranteed.

Types of lime mortar

The term 'lime mortar' is not clear-cut on account of the variety of mortar compositions and types of lime classified according to NBN EN 459-1. In addition, lime can also be combined with other binders such as cement or pozzolanic substances (e.g. trass). These are known as 'bastard mortars'.

We distinguish between two main types of lime:

- **air lime**, labelled AL here, and also known as 'greasy lime'. This type of lime is made from very pure limestone and hardens slowly through carbonation in contact with air or even through a pozzolanic reaction. A calcium-based lime in powder form is often used for masonry mortars and is classified as **CL x S** where **x** stands for the calcium and magnesium oxide content
- **lime with hydraulic properties**, labelled L here, which hardens through hydration thanks to the mixing water and, more slowly, through carbonation in contact with air. A natural hydraulic lime is used for masonry mortars and is classified as **NHL x** where **x** corresponds to the standardised compressive strength (2, 3.5 or 5 N/mm²).

Choosing mortar based on the exposure class

Eurocode 6 defines the exposure classes, from MX1 to MX5, based on various factors such as climatic conditions and exposure to moisture or humidification, freeze-thaw cycles and aggressive chemical products (see table A).

In their technical data sheets, manufacturers generally specify the exposure classes in which **pre-dosed industrial mortars** may be used.

Arte Constructo

A Exposure classes for brickwork.

Class	Exposure
MX1	Dry environment
MX2.1	Moisture without freeze-thaw cycles
MX2.2	Strong humidification without freeze-thaw cycles
MX3.1	Humidification and freeze-thaw cycles
MX3.2	Strong humidification and freeze-thaw cycles
MX4	Saturated salt air, sea water or de-icing salts
MX5	Aggressive chemical environment

B Indicative and non-exhaustive mortar compositions given the great variety of constituents.

Permitted exposure class (1)	Examples of mortar compositions					Compressive strength f_m of the mortar [N/mm²] (2)	Compressive strength f_b of the brick [N/mm²]
	In bulk binder per m³ dry sand [kg/m³]	In volume					
		Cement (C)	Air lime (AL)	Lime with hydraulic properties (L)	Sand		
All	C 400	1	–	–	3	20	$f_b > 20$
≤ MX3.2 (heavy freeze-thaw)	C 300	1	–	–	4	12	$12 \leq f_b \leq 48$
	C 250 AL 50	2	1	–	9	8	$8 \leq f_b \leq 32$
	C 200 L 100	2	–	1	10		
≤ MX3.1 (normal freeze-thaw)	C 200 AL 100	1	1	–	6	5	$5 \leq f_b \leq 20$
	C 150 L 150	1	–	–	7		
MX1 (dry environment)	C 150 AL 150	1	2,5	–	7	2,5	$2,5 \leq f_b \leq 10$
	C 120 AL 120	1	2	–	9		
	C 100 L 200	1	–	2,5	11		
	L 400	–	–	2	5		
	L 300	–	–	1	3		

(1) The permissible exposure class depends on the frost resistance of the mortar among other things. In the absence of a European method, this can be determined based on technical specifications STS 22 and NBN B 15-231.
(2) The compressive strength may vary depending on the elements chosen and can be determined according to NBN EN 1015-11.

In the case of **mortars dosed in situ**, it is more based on experience as can be seen in table B which also shows the 'mechanical' compatibility with bricks. For instance, the compressive strength of the mortar should always be less than that of the bricks.

The durability of a mortar with pure air lime as a binder cannot be guaranteed if the mortar is exposed to the outdoor climate. This type may therefore only be used for outdoor applications when restoring protected monuments where it is justified to do so for historical, cultural or aesthetic reasons or if the brickwork is sufficiently solid, provided that progressive weathering is accepted.

The bastard mortars consisting of cement and air lime most commonly used in new construction projects are 1:2:9, 1:1:6 and 2:1:9 mortars. These figures correspond to the volume ratio of cement, lime and sand respectively. Each of these mortars is accepted for a specific exposure class:
- MX1 (indoors) for 1:2:9 mortar
- MX3.1 (normal freeze-thaw) for 1:1:6 mortar
- MX3.2 (heavy freeze-thaw) for 2:1:9 mortar.

However, only a mortar with a high cement content (C 400) is suitable for exposure class MX4 (salt water environment such as on the coast).

Adhesion and dismantling

Brickwork that is constructed using lime mortar is regarded as more demountable due to its weaker mechanical performance, particularly its reduced adhesion to the bricks. For industrial performance mortars, the shear adhesion declared by the manufacturer is usually based on a standard value set at 0.15 N/mm² for a mortar for general applications of type G (see appendix C to NBN EN 998-2). This value is not determined for mortars dosed in situ. It is therefore not possible to distinguish mortars based on their adhesion or to make a well-considered choice regarding the dismantling of the brickwork based on the available information (technical data sheets, declarations of performance, etc.).

Some cement-bound mortars such as those with a low cement content, can also facilitate dismantling.

For good dismantling, it is important to find the right balance between sufficiently low adhesion of the mortar to the bricks and sufficiently strong adhesion to withstand mechanical loads.

This article was produced within the framework of the Standards Antenna 'Concrete, mortar and granulates' subsidised by NBN.

Learn more about this topic in Buildwise Article 2025/02.02.
Sign up for our newsletter to be notified when it is published.

Insulation by raising rafters: an alternative to sarking systems and sandwich panels

The method of applying insulation by raising rafters is an effective alternative to sarking systems and sandwich panels. This technique provides optimum thermal performance and fits in well with existing roof timberwork. Moreover, because it permits a wide range of materials, it is fully in line with the picture of a circular economy and sustainable renovation. However in some cases, it may be necessary to reinforce the ridge beam.

D. De Bock, Buildwise

Insulating sloping roofs on the outside provides great added value when renovating a building because it provides optimum thermal performance and limits the nuisance in the building at the same time.

There is already a lot of information available on sarking systems (see TIN 294) and sandwich panels (see TIN 251 and Buildwise Article 2020/04.02). But now there is another alternative under development: **raising rafters with the help of a new wooden structure**. This technique provides indisputable benefits in terms of stability, circular economy and adaptability to existing timberwork. However, this alternative is slightly more labour-intensive and therefore also a bit more expensive than the other methods.

André Baivier (ISOPROC)

Principles and benefits

Unlike the other methods where rigid insulation sheets are fixed to the existing rafters, with this method the rafters are raised with the help of an additional wooden structure. This then takes the form of compartments which are filled with insulation (blown in or flexible sheets). This method offers a number of benefits:

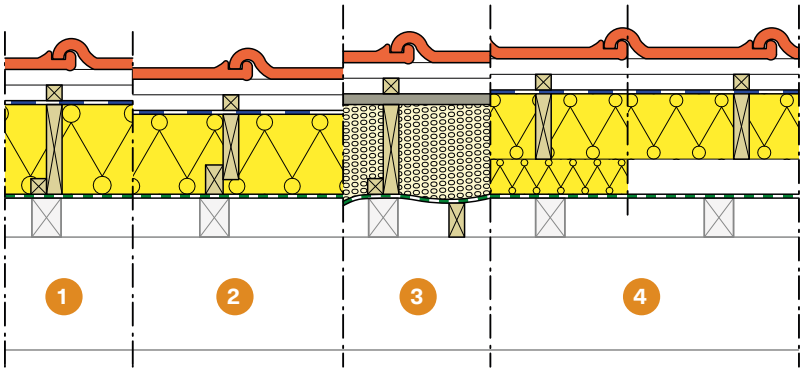
- **better integration** in old timberwork and industrial trusses
- **structural improvement** due to the reinforcing of the rafters, provided that the supports on the purlins are not changed
- **a wider range of insulating materials** (cellulose wadding, wood wool, etc.).

The raising of rafters and formation of wooden compartments can be carried out in a number of different ways. Four examples are illustrated (non-exhaustively) in figure 1 on the next page.

Comparison with existing systems

The **sarking system** (see TIN 294) requires the use of rigid boards and therefore of rafters with large dimensions. The raising of rafters allows work to be carried out on lighter (e.g. trusses) or deformed timberwork and provides a wider choice of insulation.

Sandwich panels on the other hand are often lightweight but have limits when it comes to acoustics and thermal inertia. By raising the rafters, compartments are created which can be filled with dense, fibrous insulation such as cellulose wadding or wood wool. This solution reduces noise nuisance and improves thermal comfort.



1. Normal raising of rafters
2. Raising of rafters with correction of the existing rafters
3. Raising of rafters with blown-in insulation
4. Raising of rafters in two crossed layers (restriction of the thermal bridge due to the wood fraction)

1 Different methods for raising rafters.

Technical and structural points

Dimensioning and stability

It may be necessary to reinforce the purlins, and the ridge beam in particular, depending on the additional load exerted on the existing roof timberwork.

However, it should be noted that the weight of a structure with wooden I-beams filled with lightweight insulation is similar to that of a sarking system consisting of rigid high-density fibre boards. In case of doubt, it is recommended to consult a stability engineer.

If stability is not calculated, you should make sure that the raised rafters are resting securely on the intermediate purlins, even if the rafters of the existing timberwork are sagging. For safety reasons, the ridge beam can be doubled vertically.

Sub-roof and air screen

With blown-in insulation, the use of a rigid sub-roof and reinforced damp proofing is generally recommended. However, other membranes specially designed for use with blown-in insulation may also suffice if they meet the manufacturer's specific requirements. Special attention should be paid to the design of the sub-roof in order to prevent the convex deformation of the water screen (see figure 2).

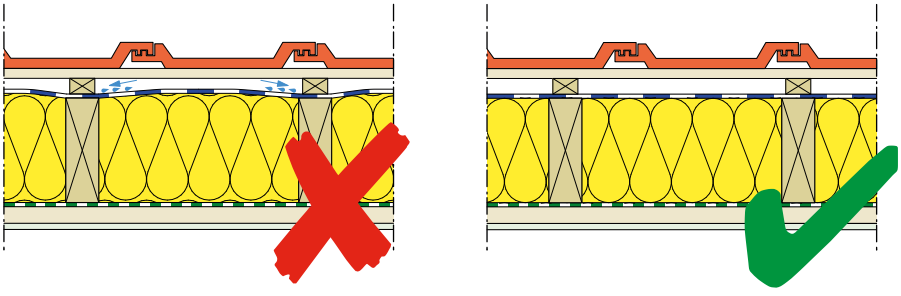
A continuous air screen and damp proofing should be installed and carefully connected at the walls and openings.

Performances and life cycle

This approach makes it possible to develop structures with a life cycle analysis (LCA) similar to that of a new structure (see strategy 1C in Buildwise Article 2023/05.06) and which are also easy to dismantle. This technique therefore provides a relevant solution for reducing the environmental impact of roof renovations. For instance, insulation in bulk and flexible insulation are lighter and require fewer raw materials for production.

To further limit this impact, it is recommended to opt for insulation made from recycled or biobased coproducts with a low carbon footprint (see Buildwise Article 2020/01.03).

Finally, with this technique it is also possible to straighten deformed roof timberwork.



2 Avoid pressure on the sub-roof.

When should the roof tiles be fixed for complex roofs?

There is a simplified method for determining the number of fixings required for roof tiles of complex roofs. This approach makes it easy to apply the existing rules for roofs with a slope of up to 45° and identifies sensitive zones. However, in special cases it is still recommended to carry out in-depth analysis.

D. De Bock, N. Depauw, Buildwise

In the appendix to Technical Information Note (TIN) 240, a method is described for determining the number of fixings required for roof tiles to enable them to resist wind uplift. This method focuses on classic roofs with one or two sides. However, a lot of buildings have more complex shapes. In those cases, the calculations should be adjusted: the hip rafters should be regarded as hip zones and the valley rafters can be counted as part of the centre zone or the eaves depending on the slope of the roof sides in question.

By taking Eurocode 1 (NBN EN 1991-1-4) as a basis and following TIN 240, we developed a simplified method for determining the number of fixings required for roofs with complex shapes. The aim of this approach is to **make the roofers' work easier by removing the need for them to carry out a full stability survey** while still ensuring the safety and durability of the structures. Thanks to this method, the tables for tile fixings in the appendix to TIN 240 can also be used for more complex configurations, subject to a number of adjustments.

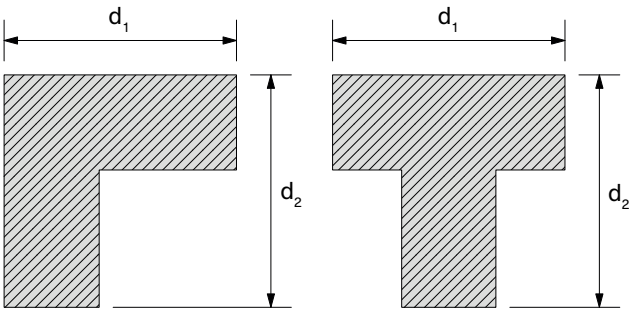
Adjustment of the calculations

Eurocode 1 defines the wind loads on buildings while taking different parameters into account: geographical zone, height, exposure and shape of the building.

TIN 240 provides several tables for adjusting the number of fixings for **standard sloping roofs** depending on local wind pressures.

In the case of **buildings with more complex shapes**, the distribution of wind forces is more irregular and less obvious to understand intuitively. However, it is possible to adopt a zone-by-zone approach based on the results for classic roofs:

- **L- and T-shaped buildings:** the intersections between the different sides of the roof (valley rafters and hip rafters) are subject to specific suction forces comparable with those exerted on the corners of rectangular roofs. It is recommended to provide an adapted fixing for the tiles in these zones. The width of these zones will depend on the dimensions of the building and corresponds to **e/10**. This value e is defined as the smallest value between one of the dimensions of the building (d) and twice the



1 Guide dimensions for an L- or T-shaped building.

Concrete case

Let us take an L-shaped house with a ridge height h of 6 m, a dimension d_1 of 10 m and a dimension d_2 of 8 m as an example.

First, we calculate e_1 and e_2. As twice the height (2·h = 12 m) is greater than d_1 and d_2, we get:

- $e_1 = d_1 = 10$ m
- $e_2 = d_2 = 8$ m.

The fixing zone of the roof tiles around the valley rafters or hip rafters is then 1 m for dimension 1 (10 m/10) and 80 cm for dimension 2 (8 m/10).

ridge height (h). For example, the following applies to the buildings in figure 1 on the previous page:
  – e_1 corresponds to the smallest value between d_1 and 2·h
  – e_2 corresponds to the smallest value between d_2 and 2·h
- **roofs with four roof sides:** the wind pressure is more evenly distributed than in the case of a roof with two roof sides. However, the hip rafters and the ridge remain sensitive zones that require reinforced fixings.

Correspondence in respect of the tables from TIN 240

By combining the wind pressures defined by Eurocode 1 with the recommendations from TIN 240 for the number of fixings, we produced a correspondence table for applying the existing rules to complex roofs with a slope of up to 45° (see tables below and associated diagrams).

The results obtained show that:
- the values from the tables from TIN 240 remain applicable provided that the zones are adjusted in accordance with the diagrams in this article
- the valley rafters, depending on the slope, should be divided into different zones:
  – for a slope of 15 to 30°: zone B in the tables from TIN 240
  – for a slope of 30 to 45°: zone A in the tables from TIN 240.

If the roof sides have different slopes such as one of 25° and another of 35°, then the appropriate method should be applied to each side of the roof. Consequently, the appropriate diagram should be used to find the best fixing for each situation.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Recommended application and restrictions

This simplified approach enables roofs with more complex architectural shapes to be constructed without the need for detailed calculations. However, for buildings situated in zones with significant wind loads, at high altitudes or with special characteristics, it may be beneficial to engage the services of a stability engineer in order to minimise the number of fixings. Tile manufacturers' recommendations also provide guarantees for the pull-out resistance of tiles.

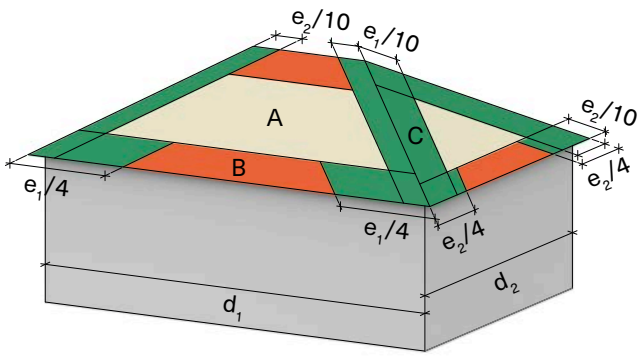
This article was produced within the framework of the Standards Antenna 'Structural Eurocodes' subsidised by NBN.

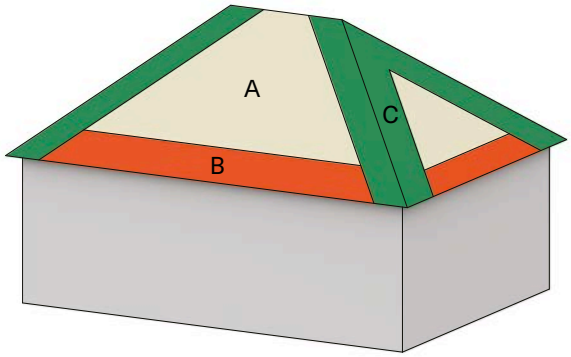
A Correspondence for slopes from 15 to 30°.

B	B	C	C	A	C	B
Bottom edge of the roof	Ridge (top edge of the roof)	Angle 2 (width e/4)	Angle 3 (width e/10)	Centre zone	Hip rafter	Valley rafter

B Correspondence for slopes from 31 to 45°.

B	A	B	C	A	C	A
Bottom edge of the roof	Ridge (top edge of the roof)	Angle 2	Angle 3	Centre zone	Hip rafter	Valley rafter





Climate roofs: prevent damage to the roof seal!

When constructing climate roofs, it is important to make sure that the roof seal is not damaged in the process. A visual inspection is required after the sealing works, possibly supplemented by additional checks. Storage, circulation and working on the flat roof should be restricted as much as possible and only permitted if the roof seal is provided with an adequate protective layer.

E. Mahieu, Buildwise

Flat roofs are becoming increasingly versatile: they can take the form of green roofs, energy roofs, roof decks and water retention roofs, for example. These so-called **'climate roofs'** provide technical and circular solutions that help with CO_2 reduction, climate adaptation, biodiversity and more efficient use of space (see also the theme page on our website).

However, they also bring with them technical challenges and risks such as a greater risk of damage to the roof seal. Those risks can be mitigated by a **well-thought-out design and close monitoring** before, during and after the sealing works.

1 Smoke injection test.

Measures before and after the sealing works

During the design process, it is crucial to choose a **technically correct** – preferably tried and tested – **and robust roof structure** (such as a warm roof or an inverted roof). It is also strongly recommended to provide for **compartmentalisation** (see TIN 280), possibly combined with integrated systems that enable the monitoring of moisture in the roof structure and/or the performance of punctual checks on watertightness (see Buildwise Article 2023/02.05).

Execution should be carried out by technically trained and specialist workers, according to the applicable Technical Information Notes (see the theme page for more information) and manufacturers' specifications.

It is very important for the sealing works to be closely monitored regularly by the designer or by someone appointed by them.

Visual inspection after the sealing works

Before installing the additional layers of the (multi)functional roof, it is essential to carry out a visual inspection of the sealing layer (absence of perforations or damage, correct execution and watertightness of seam joints and connections). This inspection will preferably be carried out by an independent party.

In addition, an **extra check** on watertightness can be provided for in a separate item in the special specifications. Various techniques can be used for this, although each of these methods has its limitations and is not applicable in every case. The approach to be followed should be chosen based on the roof structure and should be clearly described in the specifications.

Submerging

Submerging a flat roof is only useful for **non-insulated roofs or inverted roofs**. This test has little added value in the case of a warm roof because if the damp proofing has been installed correctly, any leaks will not be visible in the spaces underneath but will lead to moisture problems in the insulation.

By leaving sufficient time between the sealing works and subsequent works, any problem can manifest itself in the building, giving a good indication of the watertightness of the flat roof.

Smoke injection tests

Smoke injection tests (see figure 1 on the previous page) are only suitable for **loose or partially adhesive roof seals** where the smoke can disperse sufficiently under the seal. In the case of mechanically attached sealing systems, dispersion will depend on how far the fixings are pressed into the insulating material. With softer insulating materials, the smoke is often restricted to the width of the sealing membranes.

A vapour barrier must be present and should be completely airtight to enable sufficient pressure to build up without the partially adhesive sealing membrane coming loose.

Smoke tests are normally only used on **limited or compartmentalised roof surfaces** in order to minimise the number of penetrations that will need to be resealed afterwards.

Electrical leakage detection

The **high-voltage test** (see figure 2 and Buildwise Article 2023/02.05) is often chosen for the purpose of detecting leakage. This method is non-destructive and, unlike the low-voltage test, does not require the roof to be submerged. For this test:

- the roof surface must be completely dry
- it must not be covered
- the roof seal must not be conductive (therefore this does not work with some types of EPDM)
- a conductive layer must be present under the roof seal such as aluminium-coated insulation, a specially added conductive layer or a concrete floor.

It is recommended for **all intervening parties to be involved in these checks** in order to make them aware of the fact that the roof seal should not be damaged. In any case, the installation of additional layers on top of the roof seal must be carried out by a specialist contractor (e.g. in greening) who is aware of the risks and will take the necessary precautionary measures before working on a roof seal. After the completion of this work, it is also best for the roof seal, where accessible, to be visually inspected for damage again.

2 High-voltage electrical leak detection.

Protection of the seal before further works are carried out

During site planning, the use of already sealed roofs as storage areas or work zones should be avoided. In an initial phase, just the vapour barrier may be installed as a temporary seal if necessary. Circulation and working on a flat roof are not permitted unless **adequate protection** is provided for the roof seal and upstands. This must be strictly monitored by the main contractor or another party designated by the client. It is the responsibility of the main contractor to monitor the schedule, in order to make sure that no other works are carried out before the protective layer has been installed.

The **choice of protective layer** should be tailored to the scheduled works and the intended use of the roof. In the case of industrial flat roofs with solar panels, a continuous protective layer, for example, is less necessary but it is essential to provide protection at the support points of the installation and to make installers aware of the importance of avoiding damage.

In the case of heavy loads, a protective layer of recycled rubber matting 2 cm thick, for example, is preferable to a cast concrete slab because the latter would make it very difficult to access the roof seal later on.

This article was drawn up as part of the COOCK+ 'Climate roof' project with support from VLAIO.

Evolution of wood preservation products: what is changing?

Wood preservation products are subject to approvals with a limited period of validity which have to be renewed regularly. Certain active substances which are regarded as hazardous to health and the environment could be banned in the long term. In order to anticipate these risks, it is best to start looking for alternative solutions now.

E. Cailleux, V. Detremmerie, Buildwise

In 2013, Directive 98/8/EC on biocides was replaced by European Regulation 528/2012 (Biocidal Products Regulation or BPR). This regulates the commercialisation and use of these products, including substances intended to be used for wood preservation (specified as PT8).

These preservation products are often used to improve the durability of wood that is not naturally durable enough for the intended use class (see Buildwise Article 2013/01.04, table C).

The assessment and approval of preservation products are managed by the European Chemicals Agency (ECHA). This regulatory process is based on the assessment of the active substances (biocide molecules) and commercial formulations. If the results are favourable, approval for placing on the market is issued at national or European level. In Belgium, these approvals are issued by the FPS 'Public Health'. However, they have a time limit and have to be renewed regularly.

Certain substances may also:

- **meet exclusion criteria.** These are based on an assessment of the risks to health and the environment (carcinogenicity, persistence in nature, etc.) and can lead to a ban on the use of these substances
- be **eligible for substitution**. In that case, restrictions on use may be imposed to encourage the use of alternative solutions.

There are certain exceptions, particularly for use in a fully closed environment where dispersion into the atmosphere is restricted. However for some substances, there is no guarantee of renewal and a real risk of them being banned.

This was the case in 2023 with the renewal of the active substance known as **propiconazole**. This molecule which is used in use classes 2 to 4 protects the wood against decay fungi and blue stain. In Belgium, this substance is used in more than 65% of preservation products; yet it falls under the exclusion criteria from Regulation 528/2012. Because

1 Treatment of wood through impregnation.

A Possible solutions for replacing preservative treatments with active substances that could be banned in the long term.

Alternative solution	Points for attention
Wood with sufficient natural durability	• Assessment on a case-by-case basis • More acidic pH for some wood species which means that stainless steel hardware is required • Check on the availability of wood with the desired characteristics
Other preservative treatment	• Assessment on a case-by-case basis • More or less pronounced discolouration of the wood, possibly accelerated corrosion of metals, risk of discolouration of finishes • Low resistance to UV rays or leaching with certain treatments • Assessment of the risk of a ban on the active substances in formulations within the next ten years
Thermally modified wood (1)	• Not subject to the BPR and no chemicals added • Use possible up to use class 3 • Brownish discolouration of the wood • Better dimensional stability and reduced thermal conductivity • Available in coniferous wood and deciduous wood (check on the species available) • Slight reduction in mechanical strength • Brittleness of the wood meaning that certain precautionary measures are required during woodworking (e.g. pre-drilling of the fixings) • More acidic pH • Stainless steel recommended for screws and hardware • External wetting required for some PU adhesives
Wood chemically modified through furfurylation (2)	• Not subject to the BPR • Use possible up to use class 3 • Improved dimensional stability and mechanical strength • Stainless steel recommended for screws and hardware
Wood chemically modified through acetylation (3)	• Not subject to the BPR • Use possible up to use class 4 • Treatment not applicable to all wood species (check impregnability) • Improved dimensional stability • Possible presence of acetic acid residues • Use of stainless steel for screws and hardware
(1) Modification of the wood through thermal treatment at approximately 200 °C. (2) Modification of the wood through impregnation with furfuryl alcohol (e.g. Kebony®). (3) Modification of the wood through impregnation with acetic anhydride (e.g. Accoya®).	

of the broad scope of action of this molecule and the lack of alternative solutions, approval was extended until 2030 but with a number of restrictions on use, primarily:

- in timber: only permitted in use classes 3 (exposed to weather conditions but not in contact with the ground) and 4 (contact with fresh water)
- in joinery: only permitted in use classes 2 (outdoor environment but not exposed to weather conditions) and 3, with the exception of furniture and playground structures.

With future assessments, there is still the risk that this substance will be banned. Other molecules which are eligible for substitution such as **tebuconazole** also face an uncertain future. It should be noted that renewal procedures are under way for a number of these substances.

In order to anticipate the risks associated with a possible ban on these molecules and to avoid you having to quickly start looking for a solution, it is advisable to start evaluating alternatives now. The table above contains an initial series of recommendations. You should generally check whether products are suitable for their intended use and compatible with adhesives, finishes and sealing products.

Manufacturers are currently developing new active substances but this research will take time. In addition, these products still have to be assessed and approved by ECHA, so it may take some time before they come onto the market.

This article was produced within the framework of the Standards Antenna 'Finishes' subsidised by NBN.

What glazing should you choose for anti-intrusion joinery?

To provide the building with optimum protection, all accessible joinery should have the same level of intrusion resistance. This is determined by the most vulnerable component, whether that is a profile, the glazing or the hardware. It is therefore essential for the glazing to have the same level of resistance as the other joinery components.

V. Detremmerie, Buildwise

Requirements

Anti-intrusion glazing prevents the intruder from being able to create an opening large enough to get through or reach the hardware within the time determined by the intrusion resistance class of the joinery.

This type of glazing should comply with one of the eight categories of resistance against manual intrusion attempts defined in NBN EN 356. If the glazing is integrated in **anti-intrusion joinery**, the minimum resistance category required for the glazing is determined by the intrusion resistance class of the joinery (see table A below).

In the case of **insulating glazing**, at least one of the sheets of glass should belong to the appropriate resistance category.

The recommended intrusion resistance of a façade element will depend on the **level of protection required for the building**. That level is determined by the risk of intrusion attempts and the prevention measures taken. On the 'Intrusion resistance' page that can be accessed via the page on the Standards Antenna 'Joinery and glazing' on our website, you will find checklists for:

- single-family dwellings
- apartment buildings
- stores and showrooms
- businesses and other institutions.

These checklists can be used to determine the recommended intrusion resistance for façade elements. Resistance classes RC 2 and RC 3 are generally recommended for single-family dwellings and portal doors of apartment buildings respectively.

Classification according to NBN EN 356

NBN EN 356 defines eight categories of resistance against manual intrusion attempts for glazing and discusses two test methods. Three test pieces per category are subjected

Intrusion resistance class of the joinery (NBN EN 1627:2021)	Resistance category of the glazing (NBN EN 356:1999)	Examples of compositions of anti-intrusion laminated glass
RC 1	P2A	33.2, 44.2, 55.2
RC 2	P4A	33.4, 44.4, 55.4
RC 3	P5A	44.6, 55.6, 66.6
RC 4	P6B	Usually multi-layer laminated glass (consult the manufacturer)
RC 5	P7B	
RC 6	P8B	

A Minimum requirements for glazing.

to the appropriate tests:
- categories P1A to P5A are determined by means of an **impact resistance test**. This involves dropping a steel ball weighing around 4 kg onto the glass from a height dependent on the intended category
- categories P6B to P8B are based on the **hammer and axe test**, where each test piece is subjected to a certain number of blows according to the intended category.

For glazing to be classified in one of these eight categories, none of the three test pieces should be penetrated during the appropriate test.

The ultimate composition of the glazing is determined on a case-by-case basis, taking into account its dimensions and the loads it may be subjected to.

The table on the previous page shows a number of examples of anti-intrusion laminated glass (type PVB) that generally corresponds to the categories from NBN EN 356.

Manual intrusion resistance tests

In the case of manual intrusion resistance tests carried out according to NBN EN 1630, for resistance classes RC 2 to RC 4 only the glazing fixing system should be attacked. For classes RC 5 and RC 6, the glazing may also be tested.

In the case of joinery provided with **hardware that can be unlocked without a key** (e.g. with an emergency or anti-panic lock), it is possible to operate the mechanism via an opening in the glazing. This can be avoided, for example, by choosing laminated glazing with a sheet of polycarbonate or an equivalent material.

Installation

In the case of insulating glazing, the anti-intrusion glass which is normally stronger is **usually positioned on the inside** because:
- the outer glass has to be broken first which will make a noise, increase the risk of injury for the intruder and slow down the break-in
- any fragments of glass fall outside the building, reducing the risk of injury to residents and causing less property damage.

The **glazing beads** ensure that the glazing is held firmly in place:
- in the case of wooden joinery, it is recommended for the beads to be secured with screws
- in the case of metal joinery, these beads are usually tubular
- in the case of PVC joinery, the glazing beads are fixed using suitable seals, additional corners, etc.

In some cases, it may also be necessary to bond the glazing using adhesive compatible with the spacer used for the laminated glass and the sealing joint of the insulating glazing or to secure the glazing in the joinery profile using additional mechanical components.

1 Intrusion test on joinery with resistance class RC 3 and glazing of class P5A.

This article was produced within the framework of the Standards Antenna 'Joinery and glazing' subsidised by NBN.

Damp in cavity walls: avoid common mistakes

Cavity walls play an important part in protecting buildings from damp but they must be designed and built properly. After all, just one small error can compromise that protection and trigger infiltrations, damage and inconvenience.

K. Janssens, Buildwise

Evolution in requests for technical advice

Here at Buildwise, we have received 50% more requests for technical advice regarding the presence of moisture in buildings over the past two years.

This trend is not only due to the rise in the number of rain periods but mainly due to the increase in their intensity and duration. South-west facing façades are most affected by this.

Cavity walls: a two-stage sealing system

The cavity wall works as a **double barrier**:
- the outer leaf of the cavity wall slows down the rainwater
- the drained cavity acts as a capillary break and provides a drainage facility for the water that penetrates the outer leaf of the cavity wall.

1 Upstand of the cavity membrane at one end.

The amount of water that drains into the cavity is often underestimated. If the façade brickwork becomes saturated during a prolonged spell of driving rain, for example, up to 50% of the water that falls on the façade can penetrate through to the cavity. This amount can increase according to a number of factors such as:
- the capillarity of the outer leaf of the cavity wall
- the exposure to driving rain
- the number of open joints, especially if the facing bricks are bonded
- the presence of cracks and other irregularities.

Despite the double barrier, the importance of **good airtightness** should not be overlooked. This is usually provided by the interior finish. Without this protection, moisture in the cavity can migrate inwards through air circulation, increasing the risk of infiltrations.

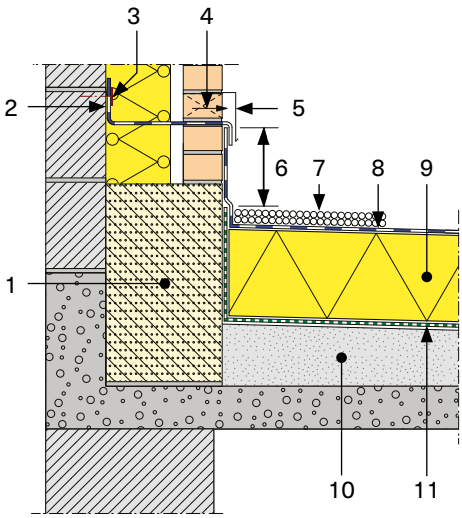
Cavity membranes

Besides the risks associated with rising damp (capillary rising damp), **infiltrations** into the building can also occur due to defective or poorly positioned cavity membranes. These membranes must be installed at the base of the wall and at every horizontal break in the cavity.

Be sure to avoid the following common mistakes:
- placing a membrane too high in relation to the break
- the presence of 'sagging' in the cavity membrane so that cavity water is not routed outside sufficiently
- insufficient overlapping of the membranes (more than 150 mm, preferably with a welded or bonded joint)
- the absence of lateral upstands at the ends of the membrane (see figure 1).

Open joints

Open joints play an essential role in draining water from the cavity. For effective drainage, it is recommended to provide at least **one joint per metre** above the membranes.



1. Thermal break to prevent formation of a thermal bridge
2. Cavity membrane (which may or may not be embedded in the supporting brickwork)
3. Mechanical fixing
4. Open butt joints
5. Metal slab
6. Height of the upstand of the roof seal > 150 mm
7. Ballast
8. Roof seal
9. Thermal insulation (thickness matched to applicable thermal regulations)
10. Sloping layer
11. Damp proofing

2 Connection to a cavity wall.

Be sure to avoid the following common mistakes:
- poorly opened joints, especially when pointing the façade: nothing should impede drainage
- the presence of joints below the level of the external paving
- joints being clogged with dirt or due to subsequent works.

Air space

An air space is only required if the cavity does not contain flexible, moisture-proof insulation. This space serves as a capillary break and provides ventilation for the cavity, allowing moisture that has accumulated in the cavity to drain more easily. The recommended minimum thickness is 3 cm but in the case of bonded façade brickwork, this can be reduced to 2 cm.

Be sure to avoid the following common mistakes:
- the presence of rubble that impedes drainage and creates moisture bridges
- poorly installed, non-moisture-proof insulation that is in contact with the outer leaf of the cavity wall.

Take care when penetrating the cavity

If they are not executed properly, elements that penetrate the cavity such as electricity cables, ventilation ducts or anchors (wall ties) can create sensitive points that can promote infiltrations. So make sure that every element that penetrates the cavity:
- is either sloping at an angle that allows the water to drain outside
- or is fitted with a drip moulding on the cavity side.

Please note: cavity membranes should never be penetrated.

Common case: connection of a flat roof to an existing cavity wall

The connection between an existing cavity wall and a flat roof, especially in the case of an extension to the main building, is a **particularly delicate construction detail** in respect of water- and airtightness. It is crucial to interrupt the cavity along the whole perimeter with the aim of:
- guaranteeing the thermal break
- blocking the transfer of moisture between the two structures.

It is essential to install a cavity membrane above the connection to prevent water infiltrations between the two structures. However, an alternative is to prevent water from reaching the cavity by installing boarding before the outer leaf of the cavity wall, for example.

Beware of misdiagnoses

It may seem paradoxical but some damp problems that appear to arise at the bottom of the wall actually start much higher up. For instance, the vertical cavities in brick structures let water pass through easily, allowing it to seep freely into the moisture barrier at the base of the wall. Because bricks absorb little water, moisture may appear only at the bottom of the wall, making it look like a rising damp problem.

Careful diagnosis often helps identify the true cause of the problem and avoid unnecessary and expensive interventions.

This article was produced within the framework of the Standards Antenna 'Construction Details' subsidised by NBN.

Which installation method prevents noise leakage at the ETICS-to-window junction?

When installing joinery in a façade finished with an ETICS, attention should be paid to the junction between the joinery and the building shell in order to limit the risk of noise leakage. It is evident from an extensive measurement campaign that specific installation guidelines only need to be followed in a very busy urban environment.

L. De Geetere, Buildwise

Definition of the problem

The risk of noise leakage at the junction with external joinery is pointed out in various Technical Information Notes on ETICS (TINs 257, 274, 279 and 283). However to date, there has been a lack of detailed knowledge regarding the acoustic performance of common methods of connection.

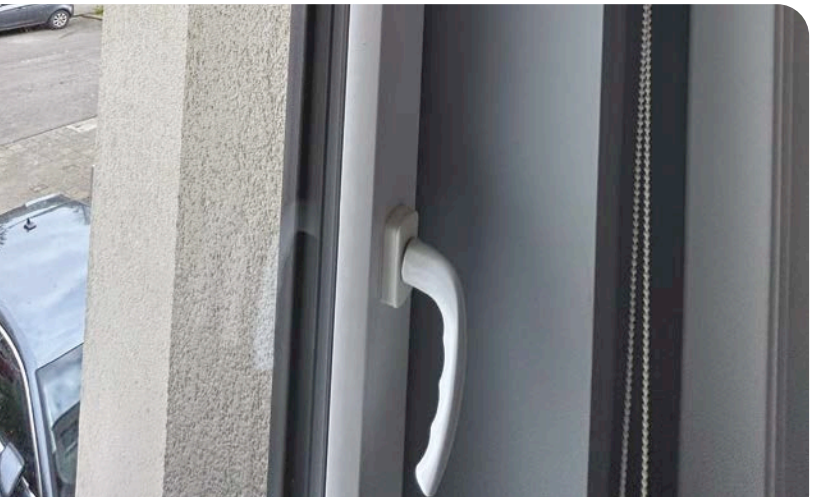
Measurement campaign

Because of that, twenty variants of common methods of installing external joinery in an ETICS façade wall were tested in our acoustics laboratory. We have distinguished between the following installation methods (see figure 1 on the next page):

- **installation method 1:** flush installation, anchoring with dowels or angle irons, interior finish using plaster boards in the reveals fixed with mounting blocks
- **installation method 2:** recessed installation, anchoring with dowels or angle irons, interior finish using plaster boards in the reveals fixed with mounting blocks
- **installation method 3:** recessed installation, anchoring with dowels or angle irons
- **installation method 4:** recessed installation, anchoring with subframe (fixed to the building shell), interior finish using plaster boards bonded to reveal boards made of XPS
- **installation method 5:** recessed installation, anchoring with continuous subframe or installation frame, interior finish using plaster boards bonded to reveal boards made of XPS
- **installation method 6:** recessed installation, anchoring with plywood installation frame (fixed to the window).

The variants where the windows are supported by lightweight (thermally) insulating building blocks were not studied.

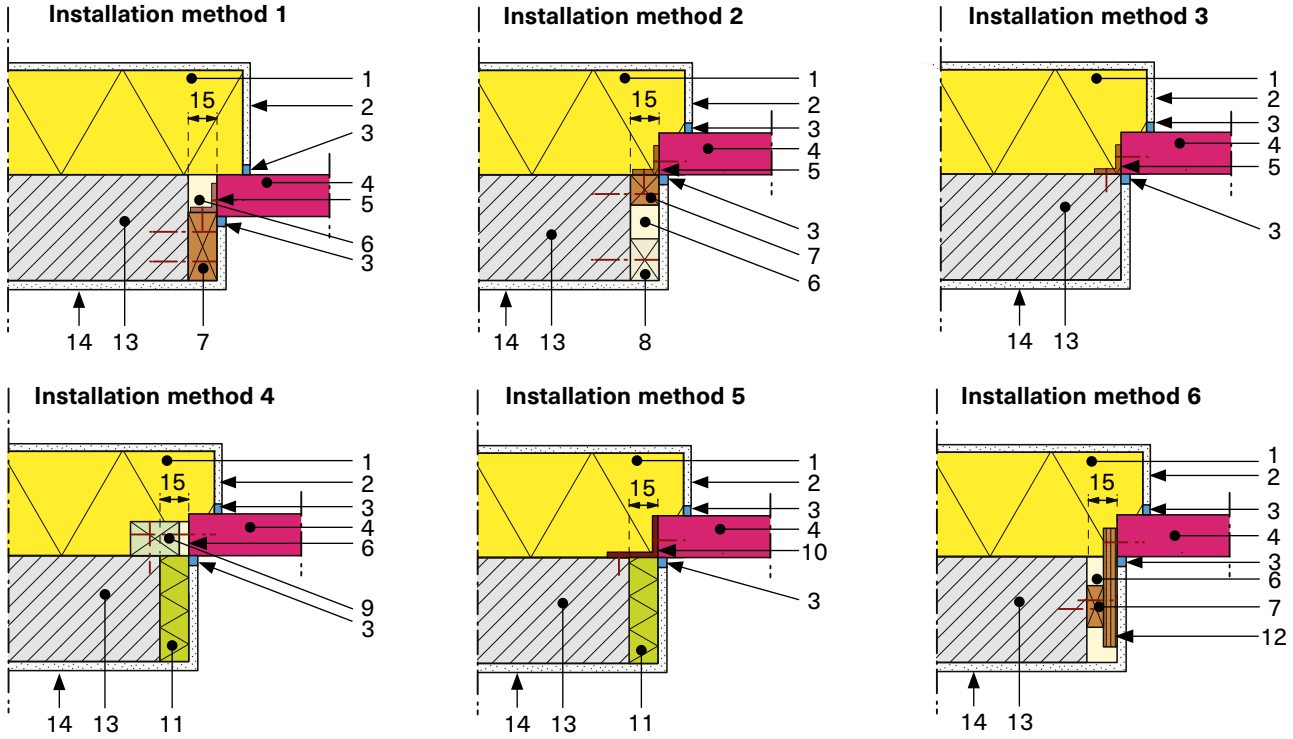
For the test set-up, a high-performing acoustic test window was installed in a heavy wall fitted with 20 cm thick EPS insulation boards in each case. It was possible to vary the installation clearance between the wooden window frame and the reveal opening between 0 and 8 cm.



Choosing the installation method

Four outside noise classes are defined in the NBN S 01-400-x series of building acoustics standards, ranging from a quiet rural environment (class 1) to a very busy urban environment (class 4). For good façade sound-proofing, the first step that needs to be taken is to make the right **choice of glass** (see Buildwise Article 2022/05.06). The **façade construction** must also be adapted to the level of outside noise (sufficiently heavy exterior finish on sufficiently thick or thermoacoustic insulation and a sufficiently heavy wall).

It is evident from the measurement campaign that in outside noise classes 1 to 3, **all the installation methods studied are likely to achieve the minimum performance requirement** (class C according to NBN S 01-400-1:2022).



1. Thermal insulation
2. Exterior finish (board/plaster)
3. Flexible joint
4. Window
5. Angle anchor
6. Sprayed installation foam
7. Mounting block
8. Support block
9. (Insulating) subframe
10. Continuous subframe or installation frame
11. Honeycomb XPS board
12. Plywood installation frame
13. Solid façade wall
14. Interior finish (board/plaster)
15. Installation clearance

1 Schematic horizontal cross-section of a number of installation methods studied.

In **outside noise class 4**, the following installation methods are suitable for meeting the minimum performance requirement:

- (recessed) methods of connection without installation clearance (see figure 1, installation method 3)
- continuous installation frames that completely cover the opening in the building shell (see figure 1, installation method 5)
- plywood installation frames in conjunction with the application of foam a maximum of 2 cm wide (see figure 1, installation method 6)
- installation methods with subframes. The clearance between the subframe and window frame should be limited to 1 cm and sprayed with installation foam (sealing tapes are advised against both from a practical and an acoustic point of view) (see figure 1, installation method 4)
- angle irons or dowels in conjunction with an internal reveal finish using plaster boards and the application of foam a maximum of 4 cm wide (see figure 1, installation methods 1 and 2).

In this highest outdoor noise class, the use of plastered internal reveal boards made of XPS in conjunction with dowels or angle irons should be avoided due to the risk of a poor connection between these boards and the reveal opening and between the reveal boards themselves which can result in acoustic leaks.

Further findings and recommendations

The measurement campaign also produced the following findings:

- an airtight connection is required between the interior and exterior finish and the window frame from an acoustic perspective (see TINs 257, 279 and 284)
- the acoustic performances of the flush and recessed installations are similar
- in the case of installations with dowels or angle irons, the noise performances decrease as the installation clearance increases. That is not the case with continuous subframes or installation frames
- doubling the surface density of the interior finish only leads to a slight improvement in noise performances
- the type and density of the subframes or installation frames is of little importance in terms of acoustics, as long as they are continuous
- with the same installation clearance (measured between the window frame and the reveal opening), plywood installation frames result in similar noise performances to installation methods with angle irons.

This article was produced as part of the 'AcouLeakEtics' research project carried out by Buildwise in-house at the request of the 'Joinery' Technical Committee and the 'Acoustics' committee.

From post-intervention files to digital passports

As a contractor, do you want to reinforce your own processes and become more efficient at preparing quotations, carrying out actual costing and planning maintenance? Focusing on passports containing structured data on materials and structures not only enables you to anticipate new regulations but also to strengthen your position in a changing market.

L. Maes, Buildwise

What's in a name?

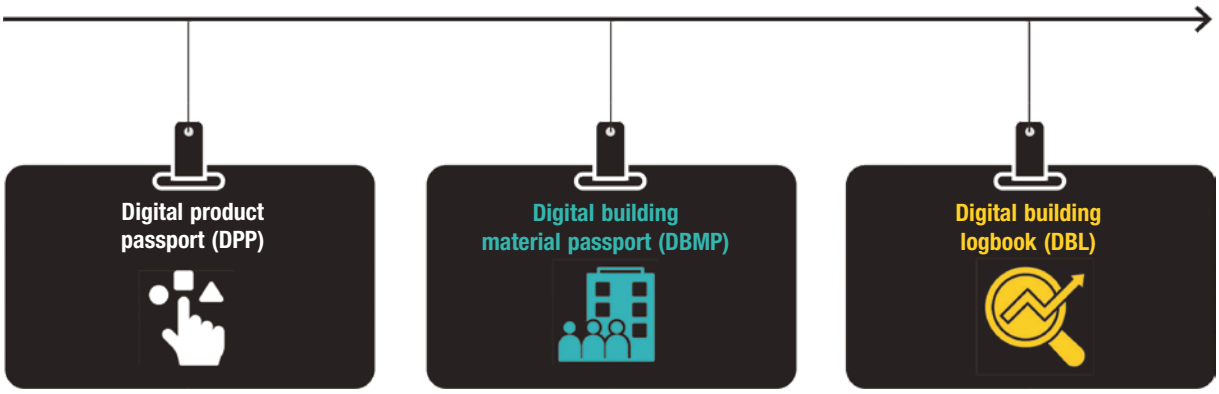
Passports in construction are a relatively new concept and currently come in all shapes and sizes. For the sake of clarity, an overview of a number of official definitions from European and Flemish policy is provided below.

A **digital product passport** (DPP) is a set of product data accessible via an electronic medium (Ecodesign for Sustainable Products Regulation, art. 2). In the long term, the DPP should become the most important tool for providing access to digital information on (physical) products in the European Union.

A **digital building material passport** (DBMP) is a digital representation of the building construction. The term 'building material' covers both buildings, infrastructure and engineering structures. This passport contains product passports, information on the method of application and quantities of the products used as well as the history of the building among other things.

A **digital building logbook** (DBL) is a common register of all relevant building data which can be used as a basis for making well-considered decisions and sharing information within the construction sector (Ecodesign for Sustainable Products Regulation, art. 2). Take the preparation of a sale dossier with soil certificate or the inspection of an electrical installation, for example. One example of a DBL is the Woningpas, a tool from the Flemish government that provides citizens with information on their home or property.

In the coming years, producers of building materials will be obliged to prepare a DPP for their products based on the Construction Product Regulation (CPR). The EU Taxonomy and Energy Performance of Buildings Directive (EPBD) and Flemish policy encourage the preparation of digital building material passports and building logbooks.



Why passports?

A passport can serve several purposes:

- **administrative simplification:** structured data in passports means you do not have to repeatedly register the same data in different instruments (permit, tender documents, quotation, post-intervention dossier, costing, reuse inventory, etc.), preparation of these instruments is automated and information becomes more reliable
- **support in connection with (life-extending) maintenance activities** such as inspections and as-a-service offerings (for more information on this, see our theme page on circular economy). Passports can also be used to send automatic reminders for maintenance works to users, as is the case with the Woningpas
- **reuse and recycling:** detailed information on building materials enables developers, designers, contractors, producers and processors to focus more on reuse and recycling
- **health and safety:** as-built information on structures is important for the safety of contractors and users, for the purpose of locating gas pipes or inspecting gas installations in order to avoid CO poisoning, for example
- **input for design and reporting tools** such as the calculation of energy performances and environmental impact via EPB software and TOTEM. In addition, providing data for sustainability reporting can be offered as an additional service to clients
- **value assessment and preservation:** passports can help banks, insurers, owners, contractors, etc. assess investment risks, determine life cycle costs, estimate the (residual) value of materials, compare the cost price of renovation and demolition, etc.

This article was drawn up as part of the 'Digital 4 Circular Construction' Living Lab, with support from VLAIO.

Getting started

- Rather than wait for regulations to come out, get ahead of the legislator (and your competitors) by **starting to experiment** with the structuring of data and preparation of passports **today**.
- Formulate **one or more clear goals** in the process. How can you anticipate future legislation today? What can passports do for you? How can you create added value for your clients?
- Start by **improving the structure of the post-intervention file**, by focusing on its completeness or by drawing up a short guide to help users navigate their way through a sea of plans and technical data sheets, for example.
- Allow the post-intervention file to evolve into a building material passport by **systematically expanding the associated data set**. Two lists containing the most important parameters for this were drawn up as part of the 'Digital 4 Circular Construction' research project. You will find these lists on the digital4circularconstruction.be website.
- **Find out about the benefits of BIM** and consider working on an existing BIM model or creating one yourself. A BIM model with links to plans and technical data sheets on a platform (e.g. Sharepoint) is already a kind of fully-fledged building material passport.
- **How can Buildwise help you** get started with passports in construction? Get in touch via the contact link on the web page 'Sustainable construction' or using this QR code.

FAQ

The three most important questions and answers on the building envelope.

Does **triple glazing** provide better **acoustic performance** than double glazing?

Not necessarily. Triple glazing will have similar acoustic performance to double glazing of the same thickness (for example, 4-16-4-16-4 triple glazing will have almost the same acoustic performance as 4-16-4 double glazing).

You will find more information in Buildwise Article 2022/05.06.

Is applying a **water-repellent treatment** to **façade brickwork** effective?

Yes. Most commercially available water-repellent treatments currently on the market are effective: they are water vapour-permeable, prevent the absorption of (rain)water by the façade and slow down the polluting of the façade. However, they do not provide the total protection provided by façade cladding.

You can find more information in Technical Information Note (TIN) 224.

Can **moss** be removed from roofs containing **asbestos**?

No. The removal of moss from materials containing asbestos is associated with the following risks:

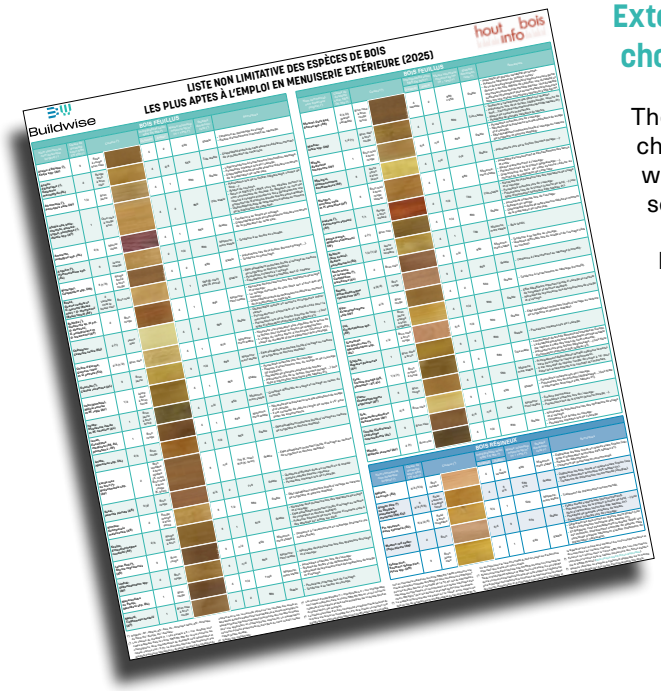
- dislodging asbestos fibres (which are stuck to the moss)
- accelerated weakening of the material and a greater risk of the release of asbestos fibres over time.

The removal of moss from roofs containing asbestos is therefore always prohibited, even if a high-pressure method for doing this is not used.

Read more about this and discover similar FAQs for your field.

Focus

on our poster on wood species and on the publication of TIN 294.



External joinery: which wood species should you choose?

The availability of wood species for external joinery is constantly changing. Some wood species have disappeared from the market while new species have emerged which can sometimes make the selection process more difficult.

Because of that, we produced a **practical table** containing the main wood species currently available, with their aesthetic and technical characteristics including their durability class. The table that is presented in the form of a poster measuring 57 x 60 cm was sent out to all our members who are joiners.

We recommend the use of stable or very stable wood with a natural durability class of 1, 2 or 3. If that durability cannot be guaranteed (e.g. due to the presence of sapwood), a preservative treatment is essential.

Are you a joiner and would like to receive another copy of the poster? If so, you can request one using the form that you will find under 'Questions regarding publications' via the following link: www.buildwise.be/fr/contact/.

Renovation details for sloping roofs according to the sarking procedure

The energy renovation of sloping roofs is of crucial importance for reducing the CO_2 emissions and energy consumption of buildings. Appropriate insulation and the improvement of airtightness can reduce heating requirements considerably.

The sarking procedure is particularly effective for converted lofts because it provides better insulation without you having to change the interior finish. This system also allows you to keep the appearance of the roof timberwork and improve energy performances at the same time.

You can find out everything you need to know on the subject in the new Technical Information Note (TIN) 294.

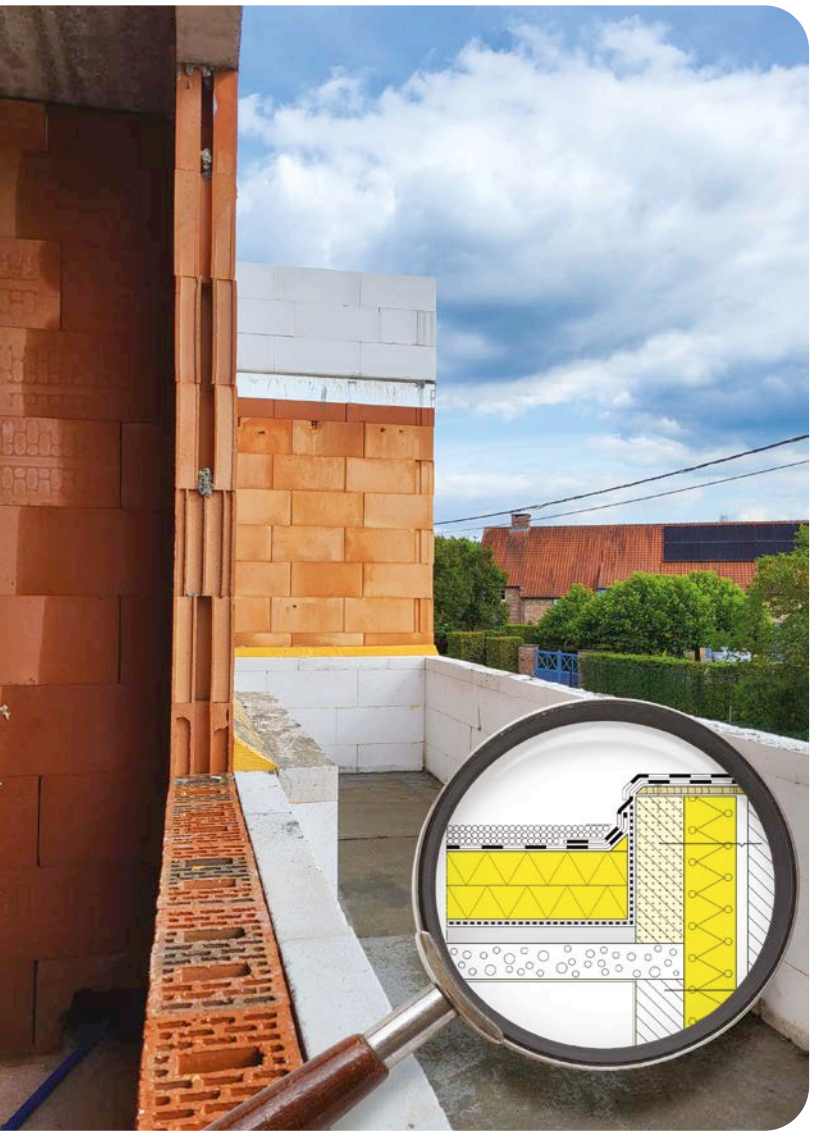
Download TIN 294 now!

Focus

on connections for flat roofs and on the many data sheets dedicated to these.

Connections for flat roofs: online and classified according to the sealing material

The Buildwise publications on flat roofs have been very well-received by building professionals: Technical Information Note (TIN) 280 is our absolute bestseller. But did you know that this document is complemented by TIN 244 dedicated to the relevant details? There are **more than 160 data sheets** available and they are not all on bitumen!



Well-designed construction details are essential for preventing problems on site and constructing sustainable, high-performance buildings. In the case of flat roofs, the **choice of seal** is extremely important: our reference details therefore take this into account.

The design of a flat roof and its connections will vary considerably depending on whether the sealing membrane is made of bitumen, an elastomer or a plastomer or whether it is liquid (according to NBN EN 13707 and NBN EN 13956).

Our TIN 244 which is dedicated to connections for flat roofs puts things in order: every detail is elaborated based on different techniques. The connection of a roof edge with an upstand of insulating brickwork is the absolute favourite with nearly 15,000 views in 2024!

This detail is available in three versions – the **technical drawing, recommendations and points for attention** – which have been adapted according to the sealing material used:

- are you thinking of using a bituminous sealing material? Are you wondering whether you need a bevel at the corner joint? You will find the answers to these questions in Construction Details Sheet 1072
- would you prefer the flexibility of an elastomer sealing material like EPDM? If so, then read the recommendations from Construction Details Sheet 1073
- are you not sure how to fix a plastomer sealing material (PVC, TPO, etc.)? Are you wondering whether you need a separating layer? Then take a look at Construction Details Sheet 1074.

Different variants are available for all other type details from TIN 244. To find them, all you have to do is select the label ‘bitumen’, ‘elastomer’ or ‘plastomer’ in our database.

This article was produced within the framework of the Standards Antenna ‘Construction Details’ subsidised by NBN.

Scan the code to consult TIN 244 directly.

Trade fairs and events

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