FRONT®

Processing Guidelines

WasteBasedBrick

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1. Introduction

- WasteBasedBricks bricks comply with the harmonised European product standard NEN-EN 771-1 for clay bricks and are produced on a project basis. Each production is accompanied by a Declaration of Performance (DoP) with CE marking.
- WasteBasedBricks are intended for use in masonry facades and structural brickwork. Suitable for both interior and exterior applications, including quay walls and retaining walls (with appropriate mortar). The product is compatible with circular building practices and demountable systems, especially when combined with lime mortar solutions.
- Product standard: WasteBasedBricks® comply with the harmonised European standard NEN-EN 771-1 for clay bricks. Each production is accompanied by a Declaration of Performance (DoP) with a CE mark. NL-BSB certificate: The bricks are NL-BSB certified under BRL 52230 (ceramic products), confirming compliance with environmental and soil quality regulations in the Netherlands.
- Warranty: A 10-year factory warranty is provided for frost resistance, backed by testing performed for each production order.
- WasteBasedSlips are a natural product and display colour nuances due to the secondary raw materials used (construction, demolition, and industrial waste) and the production process. A previously issued colour sample is representative, but deviations may occur.
- WasteBasedBricks are subject to dimensional tolerances. Example: WasteBasedSlips are derived from bricks that measure 210mm x 100mm x 50mm, with a tolerance of T2/R1. The maximum size tolerance for the full brick is 3mm x 2mm x 2mm, with a maximum size variation of 9mm x 6mm x 6mm. To ensure proper installation, a joint width of 10mm is recommended.

2. Transport and Storage

- Packages must be placed on a dry, flat surface (e.g., scaffold boards).
- Protect packaging against water and dirt while allowing ventilation.
- Keep the packaging foil open on the non-rain side.
- Avoid contact with soil and excessive moisture, which may affect product quality.
- Mix bricks from four different packages during installation to ensure even colour distribution.
- Plan for at least 5% cutting loss and breakage.
- Allow bricks to adjust to site conditions, especially in terms of moisture content, prior to installation.
- For bricks with low specific water absorption, pre-wetting 1–2 days before use (and allowing them to dry while covered) ensures they can be processed “wind-dry.”

3. Application Conditions

- Do not process bricks when daytime temperatures are below 0°C.
- When masonry must proceed under freezing conditions, protective measures are required. Follow the mortar manufacturer’s guidance for such conditions.
- Avoid pointing at daytime temperatures below 5°C.
- Protect fresh masonry and pointing work from drying out and water ingress for at least 48 hours, preferably longer.
- Prevent excessive moisture absorption during and after installation to avoid efflorescence, cement haze, or adhesion issues.
- Avoid wetting the insulation material behind the masonry.

4. Application Methods

Traditional masonry with prefabricated or site-mixed mortar

- This is the most common application method.
- For facade applications, jointing is typically done after bricklaying.
- For exterior walls: Use at least application type A mortar per BRL 1905.
- For quay and retaining walls: Use type A modified with trass.
- Prefer KOMO-certified prefabricated mortar for consistent quality.
- Mortar quality should be aligned with NEN-EN 998-2 (M5–M15) in consultation with the architect or engineer.
- Lime mortars can be considered for circular applications upon consultation.

5. Substrate Requirements

The performance of the bonded WasteBasedSlips system depends heavily on the substrate's quality. All requirements below conform to BRL 1330-3 or equivalent local standard, including strength, surface condition, moisture content, compatibility, and tolerance criteria.

- Surface preparation guidelines: before installation, perform a complete visual inspection of the substrate and surrounding load-bearing structure for dimensions and flatness, anchoring integrity, and overall stability.
- Clean the surface and remove any loose materials that may affect bonding. Ensure the surface is free from contaminants like dust, oil, and water.
- WasteBasedBricks are compatible with standard building substrates, provided that the following conditions are met: Compatible mortars are used according to the brick's water absorption class and site conditions.
- For use with lime mortar, confirm compatibility with both substrate and design specifications.
- Insulation systems behind the cavity must remain dry during and after construction.
- The moisture content of the bricks at installation must align with the requirements of the selected mortar:
    - Class IW1 & IW2 (initial water absorption < 1.5 kg/m².min): use dry.
    - Class IW3 (≥ 1.5 – < 4.0 kg/m².min): use wind-dry.
    - Class IW4 (≥ 4.0 kg/m².min): pre-wet before use.
- Avoid bricks that are too wet or too dry, as they can reduce workability and mortar adhesion.
- Bricks should not be frozen or laid in freezing conditions.
- Ensure air cavities are free of debris and have an effective width of at least 20 mm, requiring a designed cavity of ~40 mm including insulation thickness.

6. Tools & Equipment

Surface Preparation

- Measuring tape & levels – to verify substrate dimensions and flatness
- Straightedge or string lines – for aligning the base course
- Stiff brooms or brushes – for cleaning the substrate and scraped joints
- Hand tools – for removing surface contaminants like dust and debris

Bricklaying

- Brick trowels – for applying and spreading mortar
- Mortar boards – for holding and accessing mortar
- Support blocks – for setting up accurate masonry strings
- Spirit levels & plumb lines – for alignment and vertical accuracy
- Masonry saws or angle grinders – for custom fitting and cutting bricks (with dust suppression)
- Scaffolding systems – preferably height-adjustable to minimise bending or stretching
- Mechanised handling tools – for transporting divisible brick packages from the transport to the scaffold

Pointing

- Jointing irons or pointing tools – for compacting and finishing joints
- Pointing trowels – for applying mortar to joints
- Buckets or mixing tools – for preparing on-site pointing mortar
- Cleaning brushes – for removing loose particles before and after pointing

Personal Safety

- Respiratory protection – P3/FFP3 masks, especially during cutting, grinding, or sanding
- Safety gloves – for handling bricks and mortar
- Safety goggles – to protect from dust, chips, and splashes
- Hearing protection – during the use of mechanical tools
- Safety footwear – for general site protection
- Protective clothing – to avoid skin contact with mortar or dust
- Dust suppression or extraction systems – water-fed tools or local dust extraction recommended

7. Application

Read first: Masonry mortar

- Match the mortar hardness and the brick. For masonry in exterior walls, use at least mortar application type A according to BRL 1905 "Mortars for Masonry." Use mortar application type A modified with trass for quay walls and retaining walls.
- Preferably use a prefabricated mortar with a KOMO quality declaration to ensure a consistent level of quality.
- Request detailed mortar advice from the producer of the prefabricated mortar, who will indicate the requirements for the processing of the mortar in combination with the specified performance of the masonry brick. The mortar quality according to NEN-EN 998-2 (M5 - M15) should be determined in consultation with the architect/engineer.
- When preparing the mortar on-site for the installation of a typically absorbent brick, from class IW3 according to BRL 1007 "Masonry Brick," the following volumetric composition ratios can be used during the summer period: Portland cement: lime: sand = 1 : 1 : 5. For the winter period, the volumetric composition ratio is 1 : 0.5 : 4.5. To achieve good stackability and optimal construction speed, for bricks with low specific water absorption, the coarse fraction C4-C5,6 can make up a maximum of 10% to 15% of the sand volume or use concrete sand 0-4 for this purpose. Don't use admixtures in the mortar that is prepared and mixed on-site. The processing time for mortar is a maximum of two hours. For wet prefabricated mortar with a retarding agent, a maximum storage time of twelve hours is recommended.

Read first: Pointing mortar.

- The joint mortar must meet the requirements of CUR Recommendation 61 "Pointing and Hydrophobizing Masonry." Preferably use prefabricated joint mortar supplied with a KOMO quality declaration, ensuring consistent quality.
- Request detailed mortar advice from the producer of the prefabricated joint mortar, who will indicate the requirements for the processing of the joint mortar.
- The joint mortar quality, according to CUR Recommendation 61 (VH15 - VH45), should be determined in consultation with the architect. For a joint mortar prepared on the construction site, use a composition ratio in volume parts according to CUR Recommendation 61.
- Due to a high risk of 'burning', blast furnace cement is not recommended for masonry work. The sand must comply with NEN-EN 998-2 "Mortars for Masonry" and BRL 1905 "Mortars for Masonry," except for the prescribed grain size distribution. The guidelines stated in CUR Recommendation 61 apply to this.

Bricklaying

- Perform a complete visual inspection of the surrounding (load-bearing) structure regarding dimensions, flatness, anchoring, and stability, and carry out the masonry work according to the KOMO process certification of Masonry Constructions. The following guidelines apply:
- Assess the Initial Water Absorption (IWA) class of the bricks:
    - IW1 / IW2 (< 1.5 kg/m²·min) → Process dry
    - IW3 (1.5–4.0 kg/m²·min) → Process wind-dry
    - IW4 (≥ 4.0 kg/m²·min) → Pre-wet bricks
    - If bricks are too dry, they can be lightly moistened 1–2 days in advance and stored covered (top only) to allow wind-dry processing.
    - Avoid overly dry or overly wet bricks, as this leads to poor adhesion and workability.
- Lay bricks “fully and solidly”, ensuring full mortar contact at bed and perpend joints.
- Place bricks with the most attractive side facing out.
- Follow good craftsmanship and the prescribed bond pattern
- For optimal performance, combine bricks from at least four packaging units simultaneously to avoid colour clustering.

Expansion Joints

- Prepare an expansion joint plan to prevent cracking.
- FRONT® offers custom dilatation advice, calculated by TCKI and paid for by FRONT®.
- Vertical expansion joints: Width: 5 mm, Full wall thickness, Filled or unfilled with rot-resistant compression tape, Flush joints (0 mm) are not valid as expansion joints. For buildings >15m, use compression tape.
- Horizontal expansion joints: At support areas, Width: 10 mm, Filled with oil-free sealant on a backing, Must be free of mortar and grout

Ventilation and Drainage

- Leave 1 open head joint per 3–4 stretchers at terminations like above/below windows.
- Leave 1 open head joint per 2 stretchers at the base near the foundations.
- Maintain an effective cavity width of ≥ 20 mm, accounting for mortar spills.
- This typically means a design cavity of ≥ 40 mm + insulation thickness.
- Keep the cavity clear of debris, cut brick fragments, and mortar droppings.

Cavity Ties and Masonry Reinforcement

- Embed cavity wall ties in the full mortar bed joint, with the tie centred after placing the next brick layer.
- Avoid moisture bridging to the inner leaf.
- Do not anchor frames to the outer leaf.
  Do not use sliding anchors in vertical expansion joints.
  Masonry reinforcement: Use **galvanised and epoxy-coated or stainless steel** for exterior work.
- Apply mortar in two stages: First half of the mortar, Place reinforcement and apply the second half of the mortar.

Pointing

- Wait a minimum of 2 weeks, preferably 28+ days, after bricklaying before jointing.
- The masonry should not be too wet or too dry.
- Moisten the wall one day in advance to reduce the risk of efflorescence.
- Remove all dust, residue, and contamination.
- Use tools to fully fill the joint in a square cross-section.
- Joint mortar should be properly compacted.
- For standard joints, aim for a depth of 10–12 mm.
- Avoid filling expansion joints or ventilation perpends.
- Prevent soiling and smearing during pointing. Immediately remove mortar smears, especially on glazed surfaces.
- Avoid lime hydrate etching on glazed bricks — it causes dull spots.
- Use only cleaning agents based on sulfamic acid; hydrochloric acid is strongly discouraged.

8. Quality Control & Inspection

- Masonry must be executed according to the prescribed bond and craftsmanship standards, “Fully and solidly” laid with complete mortar contact at bed and perpend joints, free of mortar smears on brick surfaces, aligned with visual expectations, and using the best face outward.
- Joints must have a square cross-section, be completely filled and compacted, match the average thickness of bed and head joints, and be brushed and finished smoothly.
- Expansion joints must be present and free of mortar/grout, match the prescribed dimensions and execution details (see Chapter 7).
  Air cavities must maintain a minimum effective width of 20 mm.
- Conduct visual checks for flatness, bond pattern, joint depth and finish, and colour consistency.
- Verify that dilatation joints are in place, clean, and properly detailed.
- Inspect jointing quality and ensure no expansion joints have been inadvertently filled.

Relevant guidelines to reference during inspection:

- BRL 2826 – National Assessment Guideline for Masonry & Adhesive Constructions
- SKG-IKOB PBL 0357 – Execution Guideline for Masonry Constructions
- SKG-IKOB PBL 0359 – Execution Guideline for Jointing Masonry
- SKG-IKOB PBL 0475 – Execution Guideline for Bonding of Facade Bricks
- CUR Recommendation 61 – Jointing and Hydrophobising Masonry

9. Maintenance & Cleaning

Routine cleaning

- Brick facades made with WasteBasedBricks are low maintenance and generally become more aesthetically pleasing over time.
- However, care must be taken during and shortly after installation to avoid issues such as efflorescence, mortar smears, cement haze or loss of joint adhesion.
- Preventive measures During construction: Protect fresh masonry and jointing from rain and rapid drying for at least 48 hours, preferably longer. Avoid wetting insulation materials during and after construction. Use scaffold mesh and coverings or lightweight plastic covers to protect masonry from splashing water. Fold scaffold sections near the facade where needed to limit contamination from above. For glazed bricks: pay special attention to lime hydrate etching, which can leave dull spots — remove smears immediately.
- Cleaning methods: Use only masonry-safe cleaning agents based on sulfamic acid. Never use hydrochloric acid, as it damages both the bricks and mortar joints.
- Small-scale damage can be addressed by replacing individual bricks, ensuring matching batch and colour, and repointing damaged joints using CUR 61-compliant joint mortar. Take care to replicate joint depth, texture, and mortar type for aesthetic consistency. Avoid using aggressive cleaning methods or incompatible repair materials, especially for glazed or coloured surfaces.

10. Disposal & Recycling

End-of-life handling

WasteBasedBricks are designed with circularity in mind. At the end of their life cycle, they can be:

- Reused: If installed with lime-based mortar, bricks can often be dismantled and reused in new masonry. This method supports demountable building concepts and is encouraged for circular construction projects.
- Recycled: Bricks can be crushed and used as secondary raw material, e.g., in road foundations, aggregate in concrete, or even in new brick production. FRONT® promotes closing the loop by incorporating recycled brick and demolition waste in its own products.

11. Legal & warranty information

- WasteBasedBricks come with a 10-year factory warranty for frost resistance. The warranty covers performance under normal conditions as described in the processing guidelines and applicable standards.
- FRONT assumes no responsibility for improper installation or use of unapproved materials, failure to maintain or clean tiles correctly, leading to damage or deterioration, and alterations or modifications to installation guidelines that are not authorised.
- Installers and contractors must comply with national execution guidelines and consult the mortar and jointing mortar suppliers for tailored advice.
- For the latest version of installation and maintenance guidelines, consult FRONT directly.

12. Health & Safety

- To ensure safe handling and installation, the following PPE is required:
    - Respiratory Protection: Wear a dust mask (FFP2/N95 or higher) or a NIOSH-approved respirator when cutting or handling tiles, especially in dry conditions.
    - Eye Protection: Use safety goggles to shield against flying debris when cutting, drilling, or sanding tiles.
    - Hand Protection: Wear protective gloves to prevent skin irritation from adhesives, grouts, and tile dust.
- Always use wet cutting methods to minimise dust, or operate within a dust extraction system.
- Ventilation Requirements: Work in well-ventilated areas or use dust collectors and extraction systems when cutting or processing panels indoors.
- Avoid inhaling fumes from adhesives and sealants by maintaining airflow.
- Always opt for wet cutting methods to suppress airborne particles.
- If dry cutting is necessary, wear a properly fitted respirator and limit exposure duration.
- Regularly clean workspaces with vacuum systems or dust collectors to reduce airborne dust.
- Avoid prolonged exposure to tile dust by washing hands thoroughly after handling materials.
- Do not allow dust to accumulate in workspaces—clean surfaces regularly.
- Avoid direct skin contact with adhesives and grout to prevent irritation.
- Inhalation of dust: Move to fresh air immediately. Seek medical attention if breathing issues occur.
- Skin contact with adhesives or grout: Wash thoroughly with soap and water. If irritation persists, seek medical advice.
- Eye contact: Rinse with plenty of water for at least 15 minutes. If irritation continues, seek medical assistance.

13. Product suggestions

DISCLAIMER: Product performance and suitability can vary based on individual circumstances, regional standards, and specific project requirements. Therefore, we strongly encourage you to consult local suppliers, licensed professionals, or relevant experts to obtain advice tailored to your particular needs.
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	Exterior Facade
Bricklaying	**Bricklaying mortar such as** Weber Beamix Metselmortel Tarmac Blue Circle Quality Assured Mortar
Grouting	**Joint mortar such as** Weber beamix voegmortel Tarmac / Blue Circle Ready-to-Use Mortar
Protecting	**Masonry facade protector such as** Strikolith gevelbeschermer Stormdry Masonry Protection Cream (by Safeguard Europe)
Cleaning	**Masonry-safe cleaning agents such as** Weberklin Baroli – cementsluier verwijderaar Remmers Clean FP