FRONT®

Processing Guidelines

WasteBasedSlips

— Facade & Wall

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1. Introduction

- WasteBasedSlips are ceramic brick slips sawn from WasteBasedBricks. These 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. This includes project-specific testing for dimensions and frost resistance.
- Typical applications include facades, interior walls, and flooring systems
- WasteBasedSlips are not used as stand-alone materials but always as part of an integrated ceramic slip system, which includes the slip itself, the bonding agent, the substrate, and, where necessary, mechanical fasteners. These systems are suitable for external facades, interior wall cladding, and prefabricated concrete applications.
- The systems may include substrates such as weather-resistant cementitious or magnesium oxide boards, gypsum board (interior only), concrete, or insulation panels. System choice depends on the application and project specifics.
- 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.
- WasteBasedSlips are subject to dimensional tolerances. Example: WasteBasedSlips measure 210mm x 23mm x 50mm. 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. The thickness of the WasteBasedSlips may vary by 3 to 4mm. To ensure proper installation, a joint width of 10mm and an adhesive layer of at least 5mm are recommended.
- The application of WasteBasedSlips complies with the requirements outlined in BRL 1330-3, the KOMO® assessment guideline for the on-site application of strips by adhesive bonding. This includes: Compliance with Building Code 2012 (Bouwbesluit 2012) performance requirements for mechanical resistance and fire behaviour, Environmental requirements under the Soil Quality Decree (Besluit bodemkwaliteit), product-specific conformity with BRL 1330-1 regarding adhesive systems.

2. Transport & 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.
- Mix slips from four different packages during installation to ensure even colour distribution.
- Plan for at least 5% cutting loss and breakage.

3. Application Conditions

- Apply between temperatures of +5°C and +30°C, avoiding frost and high humidity.
- Ensure the substrate is dry and dust-free.
- Maintain proper ventilation on-site.
- The moisture content of stone cladding should not be higher or lower than the adhesive specified for the stone cladding during installation. Guidelines for this can be agreed upon in consultation with the adhesive supplier.
- WasteBasedSlips are cut using a wet saw and are typically stored outside before delivery. As such, they are not delivered in a dry state. It is critical to allow the slips to dry thoroughly before installation. A minimum drying period of two weeks in a dry, well-ventilated environment is strongly recommended to ensure proper adhesion and to minimise the risk of moisture-related issues during installation. Drying options before delivery can be discussed with your contact person at FRONT®.

4. Application Methods

WasteBasedSlips must always be installed as part of a certified adhesive slip system, consisting of:

- The slip (WasteBasedSlip)
- A compatible adhesive (cementitious or elastic)
- A suitable substrate (see Chapter 5)
- Joint mortar (if applicable)
- Optional mechanical fixings, especially in high-load or high-risk zones

There are two primary installation methods:

- Adhesive bonding on site (in-situ): This is the most common method. Slips are bonded directly onto prepared vertical substrates using a cementitious or polymer-modified adhesive. The system must:
    - Be applied by trained personnel
    - Follow the manufacturer's certified installation instructions
    - Be compatible with substrate, joint width, and environmental conditions
    - Include expansion joints as prescribed.
- Integration in prefabricated elements: WasteBasedSlips can also be factory-installed onto prefabricated concrete or panel elements under controlled conditions. This method requires:
    - Process certification of the prefab producer
    - Compliance with BRL 1330-3 requirements (or equivalent local standard)
    - Quality control of curing, jointing, and storage conditions

Both methods require the use of system-certified components and test results (e.g., bond strength, frost resistance) that demonstrate long-term performance. The complete system must have evidence of suitability under climatic conditions, as verified via BRL 1330-1 or equivalent local standard.

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.

Exterior Facade Applications

Surface preparation guidelines

- Substrates must be stable, clean, dry, flat, and structurally sound.
- Remove loose or adhesion-inhibiting particles by brushing or vacuuming. If bonded contamination is present (e.g. cement laitance), mechanical cleaning (e.g. sanding or blasting) is required.
- Remove contaminants such as oil, paint, formwork residues, or sealers.
- The difference between adjacent planes must not exceed 2 mm.
  Surface flatness must comply with the joint group:
  - *Group A* (jointless or 2–6 mm): max deviation 3 mm over 1 m, 17 mm over 15 m
  - *Group B* (joints >6 mm): max deviation 4 mm over 1 m, 20 mm over 15 m

Compatible substrate materials

- Cast-in-place or precast concrete (compliant with BRL 2813 or BRL 1008, or equivalent local standard)
- Cementitious facade boards (e.g., fibre cement, MgO boards)
- Masonry (e.g. concrete blocks or clay bricks)
- External insulation systems only if mechanically fixed and tested per BRL 1328 or equivalent local standard.

All substrate types must be dimensionally stable, load-bearing, and tested in combination with the adhesive system. Non-listed materials are only permitted if their suitability is proven by testing.

Moisture, temperature, and structural requirements

- Measured residual moisture content:
  - Concrete: max. 2.0% (by weight)
    Cement-based plaster: max. 4.0%
  - Board materials: as specified by the manufacturer
- No rising damp, water ingress, or condensation allowed. Structural provisions must prevent moisture from behind.
- Expansion joints in the building must be mirrored in the cladding system.
- Substrates must not be frozen and must remain above the minimum temperature throughout curing.

Interior Wall Applications

Surface preparation guidelines

- The substrate must be flat, dry, dust-free, and grease-free.
- No active moisture load or condensation risks.
- Remove loose particles and apply primer as required.
- Minimum substrate adhesion strength of ≥ 0.2 N/mm² (pull-off test)

Compatible substrate materials

- Plasterboard or gypsum boards.
- Interior cementitious walls or plaster layers.
- MDF or plywood (in dry rooms only).
- Concrete or calcium silicate blocks.

Moisture, temperature, and structural requirements

- Room temperature must be ≥ 10 °C during and after application (at least 24 hours).
- Relative humidity < 70% during curing.
- The substrate must not deflect, flex, or vibrate under expected loads.
- Moisture limits follow the adhesive manufacturer's specifications.

Prefabricated Applications

Surface preparation guidelines

- Concrete must comply with:
  - EN 13369: Category A (max. 2 mm deviation over 200 mm, 5 mm over 3000 mm)
    Residual moisture content: max. 2.0%
  - Free from adhesion-inhibiting substances
- Cracks wider than 0.2 mm must be assessed and remediated by a specialist
- A primer may be required depending on adhesive compatibility

Compatible substrate materials

- Precast concrete panels.
- Cementitious cladding panels
- Structural façade elements with tested insulation backing.

Moisture, temperature, and structural requirements

- Installation must be carried out under controlled indoor factory conditions.
- Adhesive must be fully cured before transport or stacking.
- Surfaces with cracks, contamination, or damage are not suitable.
- Mechanical fixings must comply with NEN-EN-ISO 12944-2, using at least corrosion class C3 components (e.g. stainless steel A2/A4).

6. Tools & Equipment

For surface preparation:

- Soft brushes (for dry-brushing WasteBasedSlips before installation).
- Dust extractors or vacuum systems.
- Spirit level and measuring tape for layout and control.
- Primer rollers or brushes (if primer is required for the substrate).

For adhesive application:

- Notched trowel (sized according to adhesive and slip dimensions).
- Mixing equipment for adhesive (low-speed electric mixer).
  Buckets and water (for cleaning tools and mixing).

For slip installation:

- Rubber mallet (for gentle tapping and alignment).
- Adhesive spreader for the "buttering-floating" method.
- Spacers or joint gauges (to maintain consistent joint width).

For grouting:

- Joint trowels or pointing tools.
- Joint finishing tools for compacting and profiling mortar joints.
- Sponge and water (for cleaning excess grout, if permitted).

For cutting and shaping:

- Wet saw (mandatory for cutting WasteBasedSlips; prevents dust and edge chipping).
- Angle grinder with diamond blade (only for dry adjustments—use with dust extraction and PPE).

Personal safety equipment (see Chapter 12):

- Gloves (abrasion protection).
- Safety glasses (especially during cutting).
- Dust mask (FFP2/FFP3) if dry cutting is unavoidable.
- Hearing protection (for use with powered saws).

7. Application

During installation of the slips, the installation instructions and application conditions provided by the respective adhesive and slip system manufacturer must be strictly followed.

Pre-check and preparation

1. Verify that WasteBasedSlips are dry. WasteBasedSlips must be wind-dried before bonding.
    - If water absorption is ≤3%, slips must be fully dry.
    - If >3%, they must be surface-dry (“wind-dry”)
2. Remove loose contamination (e.g., sawing dust) from the bonding side.
3. If contamination is persistent and affects adhesion, remove it mechanically (e.g., sanding).
4. Check slips for colour, texture, and dimensional consistency.
5. Dry-brush slips to remove sawdust, dirt, or sand.
6. Confirm substrate suitability: dry, clean, stable, and compatible with the selected adhesive.
7. Ambient temperature ≥5 °C and substrate not frozen
8. Apply primer if required by the adhesive manufacturer.

Substrate verification

1. Substrates must be dry, clean, flat, and meet all specifications from Chapter 5.
2. Tolerance for surface height deviation between planes is ≤2 mm.
3. Any construction joints or panel junctions must be fully cured before bonding strips—unless compatibility has been proven.

Adhesive application

1. Use a certified adhesive appropriate to the system, substrate, and environmental conditions.
2. Application methods: Full-surface bonding (buttering floating) using buttering floating, notched trowel or spray system or Ribbed or dot bonding if system-approved (must guarantee drainage)
3. Apply adhesive only to areas that can be covered within the adhesive’s open time.
4. Actively monitor open time: Check regularly for skin formation. Perform adhesion tests by placing and removing a test slip — if adhesive coverage is insufficient, reapply immediately.

Slip placement

1. Press slips evenly into the adhesive bed without excess force.
2. Adjust only within the adhesive's open time window.
3. Expansion joints in the substrate must be continued through the slip layer.
4. At the time of placement, the adhesive contact area must be ≥95%.
5. Remove a slip after pressing to verify the transfer.
6. Perform at least 2 checks per day per installer and after each break in work.
7. Document and archive the results.

Curing

1. Protect the bonded area from: Rain and splash water, Direct sunlight and thermal shock, Mechanical disturbance (e.g., scaffolding movement)
2. Respect the curing times of the adhesive (typically 14 days before jointing).

Jointing (pointing)

1. Begin only after the adhesive has cured.
2. For filled joints: minimum joint width: 8 mm, the Mortar must be compatible with the system.
3. For unfilled (open) joints, slips may not touch one another.

Movement joints (dilatation):

1. Structural expansion joints must be mirrored in the substrate and the slip layer.
2. Expansion joints must also be included in the panel or board material onto which slips are applied.
3. The width of the expansion joint in the cladding system must be:
    a. At least equal to the width of the structural joint.
    b. Adapted to the expected dimensional movement of the panel or substrate material.
4. These provisions are critical to prevent stress-related failures, edge cracking, or debonding due to thermal expansion or structural deformation.

8. Quality Control & Inspection

A WasteBasedSlip installation is considered correct when the following criteria are met:

- Substrate complies with flatness, adhesion strength, and moisture requirements (see Chapter 5)
- Adhesive coverage: a minimum of 95% bonding contact between slip and substrate.
- No visible defects: cracks, gaps, over-pressed joints, or floating corners.
- Joint width and depth correspond to system specifications (e.g., min. 8 mm for filled joints).
- Expansion joints are continued through all layers, and widths are adequate to accommodate expected movement.
- Slips are evenly aligned, with consistent spacing and colour distribution (achieved by mixing batches).

9. Maintenance & Cleaning

Routine cleaning

- Use soft brushes, cloths, or low-pressure water (max. 50 bar, cold) to clean the surface.
- For glazed variants, avoid abrasive materials to prevent scratching or dulling.
- Acceptable cleaning agents: pH-neutral or mildly alkaline cleaners, avoid products containing acids, solvents, or bleach.
- Always test cleaning products on a discreet area first.
- Rinse thoroughly with clean water to remove detergent residues.
- Annually inspect for:
    - Biological growth (e.g., moss, algae).
    - Loose or damaged slips.
    - Cracked joints or defective pointing.
    - In coastal or industrial environments, inspect more frequently due to air pollution or salt exposure.

Repair instructions if damage occurs

Minor damage (e.g., chipped slip or joint)

- Remove the defective slip using a small chisel or oscillating tool.
- Clean the cavity thoroughly.
- Re-bond a new slip with the same adhesive type.
- Respect the curing time before repointing.

Joint repair

- Rake out damaged or loose mortar to a depth of 10–12 mm.
  Refill with system-compatible pointing mortar.
- Avoid smearing — especially on glazed surfaces — and clean immediately with a sponge and water.

Severe or structural damage

- Inspect whether failure is local (adhesive or slip) or due to substrate deformation or water ingress.
- Always involve a façade engineer or system specialist if more than isolated defects are found.
- Structural cracks, widespread detachment, or damp ingress require root-cause assessment before repairs.

10. Disposal & Recycling

End-of-life handling

- WasteBasedSlips are composed of ceramic material made primarily from recycled construction and industrial waste. At the end of their service life:
- Slips can be mechanically removed from the substrate using chisels or demolition tools.
  Remaining adhesive or joint mortar may adhere to the back of the slip and affect reuse potential.
  If cleanly removed and undamaged, slips may be reused in low-load applications (e.g., interior cladding or artistic finishes).
- Otherwise, slips should be treated as inert mineral waste.

Environmental impact and recycling options

- WasteBasedSlips are classified as non-hazardous ceramic construction waste (EWC code: 17 01 03 – tiles and ceramics).
- WasteBasedSlips contain no volatile organic compounds (VOCs) and are free from hazardous additives.
- They comply with the Soil Quality Decree (Besluit bodemkwaliteit) and do not release contaminants into soil or groundwater.
- Crushed slips can be incorporated as granulate or filler in new bricks or slips, used as base layer material in road construction or landscaping.
- Engage with local recycling centres that accept inert construction materials for reuse.
- Avoid mixing slips with other demolition waste streams that contain hazardous or organic materials.

11. Legal & Warranty Information

- FRONT® assumes no responsibility for improper installation or use of unapproved materials, failure to maintain or clean slips correctly, leading to damage or deterioration, and alterations or modifications to installation guidelines that are not authorised.
- For the latest version of installation and maintenance guidelines, consult FRONT® directly.

12. Health & Safety

- To ensure safe handling and installation of slips, the following PPE is required:
    - Respiratory Protection: Wear a dust mask (FFP2/N95 or higher) or a NIOSH-approved respirator when cutting or handling slips, especially in dry conditions.
    - Eye Protection: Use safety goggles to shield against flying debris when cutting, drilling, or sanding brick slips.
    - Hand Protection: Wear protective gloves to prevent skin irritation from adhesives, grouts, and 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 slips 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 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 with local suppliers, licensed professionals, or relevant experts to obtain advice tailored to your particular needs.

Relying solely on the information provided here is at your own risk. We disclaim any liability for damages or issues arising from the use or purchase of any products mentioned. Always ensure compliance with local regulations and standards when selecting and using products.

	Exterior Facade	Interior wall
Substrate	**Suitable facade system for ceramic brick slips** StoTherm Strikotherm Vario Innotec Brickstrip	**Suitable substrate for ceramic brick slips** Plasterboard or gypsum boards. Interior cementitious walls or plaster layers. MDF or plywood (in dry rooms only). Concrete or calcium silicate blocks.
Primer	**Bonding primer suitable for concrete** Mapei - ECO PRIM T PLUS Omnicol Omnibind TP Primer Sopro SG 602 Primer Sealer	**Bonding primer suitable for concrete** Mapei - ECO PRIM T PLUS Omnicol Omnibind TP Primer Sopro SG 602 Primer Sealer
Adhesive	**Elastic or cementitious frost-resistant adhesive** Webertherm 370 Stocoll KM Innotect Powerbond XS-360	**Elastic or cementitious adhesive** Webertherm 370 Stocoll KM Innotect Powerbond XS-360
Joint	**Cementitious grout for brick slips** Weber steenstrip voegmortel 333 Tarmac Coloured Mortar	**Cementitious grout for brick slips** Weber steenstrip voegmortel 333 Tarmac Coloured Mortar
Sealant	**Standard sealant for bricks** Innotec Hydro Guard Sopro Natural Stone Stain Stop NFS 704	**Standard sealant for bricks** Innotec Hydro Guard Sopro Natural Stone Stain Stop NFS 704
Expansions	**Flexible caulk** Mapei Mapesil AC Sopro Ceramic Silicone	**Flexible caulk** Mapei Mapesil AC Sopro Ceramic Silicone