FORCEM SCREED BINDER.

Technical Data Sheet High-Performance Hydraulic Screed Binder with MineralCore™ Technology

Description

FORCEM is a premium cement-based hydraulic binder formulated with advanced **MineralCore™ Technology**. Designed for professional use, it enables the production of high-strength, rapid-drying, and dimensionally stable screeds. **FORCEM** offers controlled shrinkage and consistent setting characteristics, making it ideal for time-sensitive flooring applications where durability and precision are critical.

Key Features

- Rapid drying with controlled shrinkage
- High early and final compressive strengths
- Compatible with internal and external applications
- Excellent adhesion and bonding (with ACTFLEX 300)
- Moist-earth consistency for optimal compaction
- VOC compliant and low environmental impact

Typical Applications

- Screeds under tile, vinyl, timber, stone, and carpet
- Heavy traffic commercial areas
- Renovation works
- Heated floor systems
- Moisture-sensitive floor coverings

Advantages

- High UV and weathering resistance
- Excellent chemical and microorganism resistance
- Withstands aggressive environmental exposure
- Fully root-penetration resistant – suitable for green roofs and planters
- Permanently elastic with high elongation properties
- Easy to heat weld and detail onsite
- Compatible with epoxy, PU, and cementitious waterproofing systems

Technical Performance (Binder Only)

Property	Value	Property	Value
Compressive Strength (1 day)	17 MPa	**Working Time**	> 60 minutes
Compressive Strength (7 days)	25 MPa	**Moisture Content (24 hr)**	< 3%
Compressive Strength (28 days)	30 MPa	**VOC Level**	17 MPa
Flexural Strength (28 days)	5 MPa	**Coverage (per cm depth)**	25 MPa

Standard Screed Mix (1:5 Ratio)

Component	Quantity Example (by Weight)
FORCEM	10 kg
Sand (0–8 mm)	50 kg
Water	3.6–4.8 L (6–8%)

Consistency: Moist-earth – holds shape when squeezed, no dripping

Enhanced Screed Mix with ACTFLEX 300

Component	Quantity Example (by Weight)
FORCEM	10 kg
Sand (0–8 mm)	50 kg
ACTFLEX 300	1L
Water	3.3–4.2 L (5.5–6.5%)

Benefits of ACTFLEX 300

- Higher flexural strength
- Improved substrate adhesion
- Reduced water absorption and cracking
- Accelerated drying
- Compatible with underfloor heating

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Slurry Bond Coat (for Bonded Screeds)

Fresh-on-Fresh Application

Component	Ratio (by weight)
FORCEM	3 Parts
ACTFLEX 300	2 Parts
Water	Adjustable to brushable slurry

- Mechanically clean substrate
- Apply slurry 2–3 mm thick with stiff brush
- While wet, apply screed immediately
- **Do not allow to dry before screeding**

Sand Guidelines

Type	Use/Application
Washed River Sand	Best for structural screeds
Sydney Sand	Fine grade; blend with coarser sand
Plasterer's Sand	Ideal under tiles and membranes
Blended Site Mix	70% Coarse (4–8 mm) + 30% Medium-Fine (0.5–2 mm)

Substrate Preparation

Proper substrate preparation is essential to ensure the performance and durability of screeds produced with FORCEM. The procedure varies depending on whether the screed is unbonded or bonded.

Unbonded Screed Application

1. **Slip Sheet Installation:**
   Lay a **200 µm polyethylene sheet** (minimum thickness) over the entire substrate to act as a slip membrane.
2. **Sheet Overlaps:**
   Overlap each adjoining sheet by **200 mm** to prevent displacement during screed installation. Ensure that overlaps are flat and wrinkle-free.
3. **Perimeter Detailing:**
   Turn the polyethylene sheet **up the walls** at all junctions to prevent moisture ingress and edge bonding. It should be terminated above the finished screed height.

Bonded Screed Application

1. **Mechanical Preparation:**
   Prepare the substrate using mechanical means such as **diamond grinding** or **shot-blasting** to expose clean, sound concrete. This ensures maximum bond strength and opens the pore structure for slurry coat penetration.
2. **Surface Cleanliness:**
   Thoroughly remove all contaminants including dust, oil, grease, curing compounds, laitance, and any loose or friable material. A vacuum cleaner should be used to eliminate fine dust after mechanical cleaning.
3. **Slurry Bond Coat:**
   Apply a slurry bond coat using FORCEM mixed with **ACTFLEX 300 additive** and water to a creamy consistency. The slurry must be applied to the substrate while still tacky to receive the fresh screed. Do not allow it to dry.
4. **Rising Damp Consideration:**
   In areas subject to **rising damp**, apply **two coats of ACTFLEX EP 250** moisture barrier. Ensure the membrane is continuous, fully cured, and compatible with subsequent layers.
5. **Crack Treatment:**
   For structural or shrinkage cracks, use the **FORSPEC Crack Preparation System**. This typically includes resin injection and/or bridging tape methods depending on crack width and movement classification.
6. **Control Joint Integrity:**
   All existing **structural and control joints** in the substrate must be **mirrored through the screed**. Re-establish these joints by saw-cutting or forming control joints within the screed in alignment with the substrate.

Mixing Methods

Correct mixing is essential to achieve optimal compressive strength, workability, and long-term performance of FORCEM screeds. Mixing may be done using a **cement mixer** for standard volumes or a **paddle drill mixer** for smaller batch work.

A. Cement Mixer Method (Batch Mixing)

- **Dry Mix:** Add FORCEM and clean, dry sand into the cement mixer. Dry-blend for 60 seconds to ensure uniform distribution.
- **Initial Water Addition:** Add approximately 70% of the total water volume and mix for 2–3 minutes to allow the material to hydrate and blend.
- **Final Water Adjustment:** Add the remaining 30% water slowly until the mix reaches a workable, cohesive, and lump-free consistency.
- **Continue Mixing:** Mix thoroughly until smooth and consistent.

⚠ Important: DO NOT add ACTFLEX 300 into the mix unless specifically requested. It is kept out of all standard mixes by default.

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B. Paddle Drill Mixer Method (Small Batches)

- Best suited for minor works or repairs.
- Follow the same dry mix and water addition sequence as used in cement mixer preparation.
- Use a slow-speed, high-torque paddle drill mixer to blend until the mix is lump-free and fully homogenized.
- Do not add ACTFLEX 300 unless enhancement has been requested.

Optional Enhancement – Water Resistance & Density

If a **more water-resistant, dense screed** is needed for applications such as **wet areas, rooftops, balconies**, or **external zones**, FORCEM may be enhanced with ACTFLEX 300:

- Add **ACTFLEX 300** at a dosage of **2–3 litres per 20–25 kg of FORCEM**.
- Incorporate it into the water component **before** final mixing.
- This modification improves:
  - **Water repellency**
  - **Compressive and flexural strength**
  - **Surface durability**
  - **Screed density and performance in variable moisture environments**

✅ Only include ACTFLEX 300 in consultation with the installer, specifier, or when the application environment specifically requires enhanced properties.

Pumped Screed Application

- Pumped systems require consistent preparation and workflow to avoid segregation or inconsistent setting:
- **Pre-lubricate** the hose system with a small batch of freshly mixed FORCEM to prevent blockages.
- Utilize either **dry pre-mix hoppers** or **integrated mixing and pumping systems**.
- Maintain **uniform moisture content** using the "**squeeze ball test**" — the mix should hold shape without bleeding water.
- Apply screed in **lanes 1.2 to 1.5 metres wide**, ensuring continuity between batches.
- Use **screed bars, straightedges, or laser levels** to set accurate height and level tolerances.
- Avoid **over-troweling**, as this may weaken the surface finish or trap air.

Reinforcements (For Screeds >50mm)

For screeds exceeding 50 mm thickness or subject to heavy loads:

- Incorporate **30 x 30 mm welded wire mesh**, 2–3 mm diameter.
- Place the mesh within the **upper third of the screed layer** to control cracking and increase flexural strength.

Flooring Overlays

Before installing resilient or timber floor coverings:

- Assess Relative Humidity (RH) and pH in compliance with AS 1884:2012.
- If RH levels exceed acceptable limits, apply a **moisture barrier system**:
  - **ACTFLEX EP 250** – epoxy-based moisture barrier.
  - **ACTFLEX 988 CWP** – cementitious waterproofing membrane.

Coverage Guide

Screed Thickness	FORCEM Required (kg/m²)
10mm	2.0 – 2.5kg
40mm	8.0 – 10.0kg

Floating Screeds (Min 55mm Thick)

Floating screeds are installed over insulating or heating systems:

- The preparation and application are similar to **unbonded screeds**.
- Use a **compression-resistant separating layer** that deflects no more than **3 mm** under full load.
- **Underfloor heating pipes** must be positioned **at least 25 mm below** the screed surface.
- Place **reinforcing mesh over the heating pipes** for added stability.
- Heating systems may be **commissioned after 4 days** of screed curing.

Moisture Content Measurement

Due to the specific chemical composition and setting characteristics of **Topcem**, standard **electronic moisture meters** are not suitable and may provide inaccurate readings. To accurately assess residual moisture, use only a **carbide hygrometer (CM method)** as per industry best practices.

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Cleaning

- All tools and equipment used during mixing and application can be cleaned with **clean water** before the product hardens

Consumption

Material consumption depends on both the **screed thickness** and the **dosage rate** of Topcem used.

- For standard dosages between **200–250 kg of Topcem per cubic metre** of aggregate, the expected consumption is:
  - 2.0 to 2.5 kg/m² per cm of screed thickness

Packaging

- Supplied in 20kg multi-ply paper bags with inner lining to preserve product quality.

Storage

- Store in a **cool, dry environment** in its original sealed packaging.
- Shelf life is **12 months** from the date of manufacture when stored under suitable conditions.

Data Sheet

This Technical Data Sheet (TDS) and the Material Safety Data Sheet (SDS) are subject to revision at any time to ensure compliance with relevant Australian Standards and to incorporate advancements in technology. Before use, it is essential to read the most current SDS and TDS thoroughly, as application and performance data may be updated periodically. For the latest technical information, please contact FORSPEC Protective Coatings at 02 8021 3517 or email info@forspec.com.au to request a copy. The data provided here is representative but does not constitute a comprehensive specification. For specific projects, it is advisable to consult directly with the company for tailored specifications.

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