

0612P POLYFLOR KIESEL SELF-LEVELLING CEMENTITIOUS TOPPINGS

Branded worksection

This branded worksection *Template* has been developed by NATSPEC in conjunction with **PolyflorAustralia Pty Ltd** (the Product Partner) and may be used whilst the Product Partner is licensed to distribute it. The copyright remains with NATSPEC. As with all NATSPEC worksections, it is the responsibility of the user to make sure it is completed appropriately for the project. The user should also review its applicability for local conditions and regulations. Check www.natspec.com.au for the latest updated version.

Worksection abstract

This branded worksection *Template* is applicable to **Polyflor Australia Pty Ltd** for its Kiesel brand of smoothing and self-levelling cementitious toppings on floors. There is no relevant standard in Australia.

Background

Toppings may be used for a variety of purposes, principally for levelling before laying of other floor finishes and as wearing surface for direct foot and vehicular traffic. Any topping which is critical in appearance or function should have structural engineering assessment, particularly if shrinkage problems are to be minimised. There are numerous guides available from BRANZ and Cement Concrete and Aggregates Australia (CCAA).

Guidance text

All text within these boxes is provided as guidance for developing this worksection and should not form part of the final specification. This *Guidance* text may be hidden or deleted from the document using the hidden text *Hide* and *Delete* functions of your word processing system. For additional information visit FAQs at www.natspec.com.au.

Optional style text

Text in this font (blue with a grey background) covers items specified less frequently. It is provided for incorporation into *Normal* style text where it is applicable to a project.

Related material located elsewhere in NATSPEC

If a listed worksection is not part of your subscription package and you wish to purchase it, contact NATSPEC.

Related material may be found in other worksections. See for example:

- 0314 Concrete in situ.
- 0315 Concrete finishes.
- 0613 Terrazzo in situ.
- 0651p POLYFLOR in resilient finishes.

Documenting this and related work

You may document this and related work as follows:

- Show the location of this and other floor finishes on drawings to your office documentation policy.
- Use the specification to define the type(s) of toppings.
- Show the arrangement and details of joints on the drawings.
- Refer to BRANZ Bulletin 389 for information on concrete toppings.

The *Normal* style text of this worksection may refer to items as being documented elsewhere in the contract documentation. Make sure they are documented.

For example:

- Surface treatment.

Search acumen.architecture.com.au, the Australian Institute of Architects' practice advisory subscription service, for notes on the following:

- Guarantees and warranties.

Specifying ESD

The following may be specified by including additional text:

- Low VOC emitting materials.
- Recycled material content.
- Lightweight products, reducing transportation requirements.
- Products resistant to mould when applied in damp environments.

Refer to the NATSPEC TECHreport TR 01 on specifying ESD.

1 GENERAL

Polyflor is a distributor of Kiesel screeds and adhesives. Kiesel is a manufacturer and supplier of Low VOC Green Star compliant screeds and adhesives. Kiesel has been manufacturing and developing screeds and anti-microbial adhesives for the flooring industry for over 50 years. They pride themselves on providing innovative products for all requirements of subfloor preparation and adhesives for the floor covering industry. Their products have superior coverage rates and self drying technology.

1.1 RESPONSIBILITIES

General

Requirement: Provide cementitious toppings as documented.

Documented is defined in 0171 General requirements as meaning contained in the contract documents.

Performance

Requirements:

- Consistent in level, finish, colour and texture.
- Free of discontinuities.
- Fully bonded.
- Resistant to environmental degradation within the manufacturer's stated life span.
- Accommodating movement in the substrate between control joints.
- If floating, without edge curl.
- If bonded, without drummy areas.
- Without obvious shrinkage cracks.

It is the responsibility of the designer to select the surface finish to conform to the requirements for slip resistance.

1.2 COMPANY CONTACTS

Polyflor Australia Pty Ltd technical contacts

Website: www.polyflor.com.au.

1.3 CROSS REFERENCES

General

Requirement: Conform to the following:

- 0171 General requirements.

0171 General requirements contains umbrella requirements for all building and services worksections.

List the worksections cross referenced by this worksection. 0171 General requirements references the 018 Common requirements subgroup of worksections. It is not necessary to repeat them here. However, you may also wish to direct the contractor to other worksections where there may be work that is closely associated with this work.

NATSPEC uses generic worksection titles, whether or not there are branded equivalents. If you use a branded worksection, change the cross reference here.

1.4 STANDARDS

Slip resistance

Classification: To AS 4586.

See NATSPEC TECHnote DES 001 on slip resistance. The slip resistance of timber varies with the type of timber and finish applied. See WoodSolutions 48 for options that increase wood's slip resistance, including choice of orientation for pedestrian traffic, surface texturing, incorporating inserts and attachments and applying coatings.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals

Website: www.polyflor.com.au/kiesel

1.6 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- Concrete class – normal: Concrete that is specified primarily by a standard compressive strength grade up to 50 MPa and otherwise in conformance with AS 1379 clause 1.5.3.
- Substrate: The surface to which a material or product is applied.
- Topping: Mixture of binders, aggregate and water applied to substrates in a plastic state and dried and cured to a hard surface.
- Topping function:
 - . Levelling: Topping placed to receive applied floor finishes.
 - . Wearing: Topping placed to act as the finished floor.
- Topping method:
 - . Bonded or post applied: Topping which is bonded to a hardened substrate from which laitance has been removed and to which a bonding agent has been applied.
 - . Floating: Topping which is separated from a hardened substrate by a resilient layer.
 - . Monolithic or wet applied: Topping placed on a plastic substrate so that a chemical bond is created between the substrate and the topping.
 - . Separated: Topping which is separated from a concrete subfloor by a membrane.

Edit the **Definitions** subclause to suit the project or delete if not required. List alphabetically.

1.7 TOLERANCES

General

Thickness: Deviation from the documented thickness:

These tolerances are intended to accommodate the combinations of concrete sub-floor variations and nominal thicknesses specified.

- Thickness < 15 mm: ± 2 mm.
- Thickness ≥ 15 < 30 mm: ± 5 mm.
- Thickness ≥ 30 mm: ± 10 mm.

Flatness: Maximum deviations from a straightedge laid in any direction on a plane surface:

- Class A: 4 mm from a 2 m straightedge.
- Class B: 6 mm from a 3 m straightedge.

These tolerances are unlikely to be precise enough for super flat floor profiles required in high bay warehouses. See ACI 302-1R and ASTM E1155M test method for determining FF (floor flatness) and FL (floor levelness) numbers. It has been assumed that smoothness and projection tolerances form part of substrate preparation for the applicable floor finishes. If the final substrate correction is to be performed at this stage, import the tolerance values from 0651 Resilient finishes, 0652 Carpets, 0654 Engineered panel flooring or 0655 Timber flooring as appropriate.

1.8 SUBMISSIONS

Operation and maintenance manuals

Requirement: At completion, submit the Kiesel's published use, care and maintenance instructions.

Products and materials

Manufacturer's data: Submit Kiesel's product data for the following:

- Admixtures.
- Bonding products.
- Colouring products.
- Curing products.
- Sealant products.
- Slip-resistant products.
- Surface treatment products.

Edit the above list as appropriate.

If testing of the strength grade of pre-mixed concrete for toppings is required, consider changing the following *Optional* style text to *Normal* style text:

Product conformity: Submit current assessments of conformity as follows:

- Premixed concrete: Production assessment to AS 1379.

Prototypes

General: Prepare prototypes of each topping type:

- Size: 1200 x 2400 mm.

Vary size of prototype if required or delete.

The following *Optional* style text may be included by changing to *Normal* style text:

Incorporation: Subject to approval, incorporate the prototype in the completed works.

Show on the drawings the location, extent and other details of the prototypes. Delete if the size of the project does not justify a prototype.

Samples

General: Submit samples of the following products:

- Colouring products.
- Control joint products.
- Surface treatment products.

Tests

0171 General requirements covers tests in **Definitions** and calls for an inspection and testing plan under **SUBMISSIONS, Tests**.

Site tests: Submit results, as follows:

Detail the tests required in **PRODUCTS** or **EXECUTION**, as appropriate, and list the submissions required here.

Site testing is expensive. Delete if not required. See NATSPEC TECHnote DES 001.

- Flatness.
- In situ crushing resistance/soundness.
- Slip resistance test of completed installation.

Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

Describe the requirements of warranties in **PRODUCTS**, or **EXECUTION**, as appropriate, and list the submissions required here.

1.9 INSPECTION**Notice**

General: Give notice so that inspections may be made of the following:

- Substrates ready for laying of toppings.
- Prototypes ready for inspection.

Amend to suit the project, adding critical stage inspections required.

Hold Points, if required, should be inserted here.

2 PRODUCTS**2.1 GENERAL****Product substitution**

Other products: Conform to **PRODUCTS, GENERAL, Substitutions** in 0171 General requirements.

The 0171 General requirements clause sets out the submissions required if the contractor proposes alternative products. Refer also to NATSPEC TECHnote GEN 006 for more information on proprietary specification.

Product identification

General: Marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Quantity.
- Product reference code and batch number.

- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.

Edit the list to suit the project or delete if not required.

Storage and handling

General: Deliver, unload and store products and accessories in unbroken manufacturer's packaging and containers in a dry, well-ventilated and secure storage area, unaffected by weather.

2.2 MATERIALS

Water

General: Clean and free from any deleterious matter.

Slip resistance products

General: Provide proprietary products manufactured to improve the wet-slip resistance of toppings.

- Silicon carbide granules:
 - . Granule size: $\geq 300 < 600 \mu\text{m}$.
- Silicon carbide two-part resin:
 - . Granule size: $\geq 300 \mu\text{m}$.

Product: [complete/delete]

Kiesel self-levelling toppings provide a slip resistance classification of R9. If greater slip resistance is required apply a surface coating.

Surface treatment products

General: Provide proprietary products manufactured for use with cement-based toppings to change the characteristics of the surface of the finished topping.

Treatment: [complete/delete]

If to be used as a wearing surface apply epoxy or polyurethane coating.

2.3 POLYFLOR KIESEL PRODUCTS – SELF-LEVELLING CEMENTITIOUS TOPPING

Aggregates

Fine aggregate: Fine, sharp, well-graded sand with a low clay content and free from efflorescing salts.

Patching compounds

Product: [complete/delete]

Select from the following Polyflor products and nominate here or in the **Selections** if more than one product:

- Kiesel Servoplan R 300 S.
- Kiesel ServoFine F 333.
- Kiesel Servoplan BF 850.

Priming products

General: Provide Polyflor Kiesel primers manufactured for preparation of non-absorbent and absorbent substrates.

Product: [complete/delete]

Select from the following Polyflor products and nominate here or in the **SELECTIONS** if more than one product:

- Kiesel Okatmos EG 20.
- Kiesel Servoplan Okapox GF.
- Kiesel Okatmos DSG.
- Kiesel UG30.
- Kiesel Okapox Accelerator.

Self-levelling cementitious toppings

Product: [complete/delete]

Select from the following Polyflor products and nominate here or in the **SELECTIONS** if more than one product:

- Kiesel Servoplan P200 Plus.
- Kiesel Servofix FG.
- Kiesel Servoplan FS 101.
- Kiesel Servoplan S 111.

- Kiesel Servoplan S 444.
- Kiesel Servoplan Ki1.
- Kiesel Servoplan RE 330.
- Kiesel Servocret RS.
- Kiesel Servofix SLA.

2.4 CONTROL JOINTS

Control joint materials

General: As documented.

Document in the **Control joints schedule**.

Control joint strip: A proprietary expansion joint consisting of a neoprene filler sandwiched between plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Proprietary slide plate divider strip: An arrangement of interlocking metal plates grouted into pockets formed in the concrete joint edges.

Sealant: One-part self-levelling non-hardening mould-resistant, silicone or polyurethane sealant applied over a backing rod. Finish flush with the terrazzo surface.

- Floors: Trafficable, shore hardness greater than 35.

Backing rod: Compressible closed cell polyethylene foam with a bond-breaking surface.

3 EXECUTION

3.1 PREPARATION

Substrates

Hardened concrete: Roughen by scabbling or the like to remove 2 mm of the laitance and expose the aggregate.

General: Provide substrates in accordance with Polyflor Kiesel Technical Data Sheets and as follows:

- Clean and free from any deposit which may impair adhesion of monolithic or bonded toppings.
- Remove excessive projections and voids and fill hollows with a mix not stronger than the substrate or weaker than the topping.

Refer to NATSPEC TECHnote DES 008 on the preparation of concrete substrates.

Timber substrate correction: Refix loose boards and sheets, sand to remove surface contamination.

Priming

General: Before priming make sure the substrate is free of all contaminants. Provide a priming product conforming to the Polyflor Kiesel Technical Data Sheets.

3.2 APPLICATION – POLYFLOR KIESEL SELF-LEVELLING CEMENTITIOUS TOPPINGS

Mixing

General: Mix with clean water using an electric mixer with beater paddle at minimum 600 rpm for a minimum of 90 seconds after the powder is wet.

Installation

General: Spread mix with a smoothing trowel or rake and leave to level.

Additional layers: Apply as follows:

- Immediately wet on wet to a traffic ready topping.
- Reprime if topping has cured.

Patching compounds

General: Apply with levelling trowel.

Edges: Cut edges after 30 minutes or smooth with a moist levelling trowel.

Slip resistant treatment

Surface treatment: Apply silicon carbide granules after floating and before the topping surface has set, and trowel into the surface so that the granules remain exposed.

Application rate: 1 kg/m² evenly distributed.

Slip-resistant treatment to stair treads and landings

Slip resistance treatment: Form two grooves and fill with a silicon carbide two-part resin.

Dimensions: 10 mm deep, 15 mm wide, length width of tread less 100 mm.

Position:

- First groove: Centre 35 mm from tread nose.
- Second groove: Centre 60 mm from step nose.

Surface treatment

General: Apply the surface treatment after floating and before the topping surface has set.

Edit to suit Kiesel's recommendations.

Temperature control

General: Make sure that the temperature of mixes, substrates and reinforcement are not less than 5°C or greater than 35°C at the time of application.

Severe temperature: If the ambient shade temperature is greater than 38°C, do not apply topping.

3.3 CONTROL OF MOVEMENT

The purpose of control joints is to accommodate movement in the finish or the substrate, or both. Movement may be caused by substrate shrinkage, thermal expansion and contraction, and the like. The location and details of all control joints should be shown on the drawings. Check the expected movement of structural control joints with the structural engineer and ensure the joint width will accommodate the anticipated movement. Where floor heating is installed or where passive solar heating is a design feature, pay particular attention to the added requirements for control joints and consider flexible adhesive.

General

Requirement: Provide control joints as documented and as follows:

- Location:
 - . Over structural control joints.
 - . To divide complex room plans into rectangles.
 - . Around the perimeter of the floor.
 - . At junctions between different substrates.
 - . To divide large topping-finished areas into bays.
 - . At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.

Document in the **Control Joints schedule**. Show on drawings. Suggested spacings are 6 m x 6 m internally and 4 x 4 m externally at the ratio of 1:1.6.

- Depth of joint: Right through to the substrate.
- Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

Control joints to divide topping into bays: Provide joints using one of the following methods:

- Form in situ using square edge steel forms and trowelling a 3 mm radius to edges.
- Form a groove, extending at least one quarter the depth of the section, either by using a grooving tool, by sawing, or by inserting a premoulded strip.
- Install a control joint proprietary product, as documented.

Edit topping joints alternatives as appropriate.

3.4 JOINT ACCESSORIES**Weather bars**

General: Provide a corrosion resistant metal weather bar suitably fixed to the substrate. Locate directly below the centres of closed doors.

Floor finish dividers

General: Provide a corrosion resistant metal dividing strip suitably fixed to the substrate at junctions with differing floor finishes, with top edge flush to the finished floor. If changes of floor finish occur at doorways, make the junction directly below the centre of the closed door.

3.5 TESTING

0171 General requirements covers tests in **Definitions** and calls for an inspection and testing plan under **SUBMISSIONS, Tests**.

Site tests

General: Test and access conformity of construction as follows:

- Flatness: If flatness properties are required:
 - . Method: To ASTM E1155M.

This is a test of finished work and would only be for super flat floors. Delete if ASTM E1155M requirements are not required.

- In situ crushing resistance/soundness: If a soundness category is required:
 - . Method: To BS 8204-1.

BS 8204-3 describes a BRE screen tester which creates an indentation that can then be measured. This is a test of finished work and would only be specified for special floors. Other properties that could be documented include wear resistance and slip resistance. Delete if BS 8204-1 requirements are not required.

Completion tests

Slip resistance of completed installation: To AS 4663.

Delete if not required. See NATSPEC TECHnote DES 001. The wet-barefoot inclining platform test and the oil-wet inclining platform test cannot be performed in situ.

3.6 COMPLETION**Curing**

General: Prevent premature or uneven drying out and protect from the sun and wind.

Curing: Use a curing product or, as soon as toppings have set sufficiently, keep them moist by covering with polyethylene film for seven days.

Joint sealant

General: If required, seal joints as follows:

- Formed joints ≤ 25 mm deep: With filler and bond-breaker.
- Sawn joints: Full depth of cut.

Protection

General: Protect finished work from damage during building operations.

Warranties

Requirement: Cover materials and workmanship in the terms of the warranty from the installer.

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: As offered by the installer.

List the requirements of the product to be warranted. Usually 10 years for installation and 7 years for products. Confirm with installer.

4 SELECTIONS

Schedules are a way of documenting a selection of proprietary or generic products or systems by their properties. Indicate their locations here and/or on the drawings. Refer to NATSPEC TECHnote GEN 024 for guidance on using and editing schedules.

4.1 SCHEDULES**Polyflor smoothing self-levelling cementitious toppings construction schedule**

Property	CT1	CT2	CT3
Polyflor product			
Substrate			
Primer			
Thickness			
Fine aggregate grain size (mm)			
Slip resistance classification			
Slip resistance product: Colour			

Property	CT1	CT2	CT3
Topping joints			

CT1, CT2, CT3: These designate each instance or type or location of the item scheduled. Edit to align with the project's codes or tags.

Edit codes in the **Schedule** to match those on the drawings.

Polyflor product selection: Use the link to the Polyflor Kiesel website for the selection of the floor finish and the product characteristic.

Substrate: Either concrete or timber.

Primer: As recommended by Polyflor Kiesel.

Thickness: As documented.

Fine aggregate grain size: Nominate the size in accordance with the product selected.

Slip resistance classification: For selections refer to NATSPEC TECHnote DES 001, SA HB 197 and SA HB 198. Select the slip resistance test and classification to suit the location and application.

Refer also to *CCAA Data Sheet Slip resistance of residential concrete paving surfaces* and *CCAA Data Sheet Slip resistance of polished concrete surfaces* for guidance.

Slip resistance product: Colour: e.g. carbide silicon colour.

Topping joints: e.g. trowel V joint in situ, to control minor shrinkage cracks usually at 1200 x 1200 mm for non-reinforced topping.

Control joints schedule

Property	A	B	C
Control joint strip: Joint side-plate material			
Control joint strip: Neoprene colour			
Control joint strip: Width			
Control joint strip: Fixing			
Proprietary slide plate: Product			
Proprietary slide plate: Material			
Proprietary slide plate: Insert colour			
Sealant: Type			
Sealant: Colour			
Sealant: Width (mm)			

A, B, C: These designate each instance or type or location of the item scheduled.

Edit codes in the **Schedule** to match those on drawings.

Control joint strip:

- Joint side-plate material: e.g. Perforated brass angles.
- Fixing: e.g. Mortar bed.

Proprietary slide plate:

- Material: e.g. stainless steel.
- Insert colour: Nominate colour or omit if no insert.

Sealant:

- Type: e.g. One part modified silicone or polyurethane. For major movement joints a proprietary system of sliding plates may be required.
- Colour: State requirement if sealant is to be specially coloured.

Edit joint strip type as required.

Joint accessories schedule

Property	A	B	C
Floor finish divider: Type			
Floor finish divider: Material			
Floor finish divider: Finish			
Floor finish divider: Size			
Weather bar: Type			
Weather bar: Material			
Weather bar: Finish			
Weather bar: Size			

A, B, C: These designate each instance or type or location of the item scheduled.

Edit codes in the **Schedule** to match those on drawings.

Floor finish divider:

- Type: e.g. Angle.
- Material: e.g. Brass, Anodised aluminium, Zinc or Rebonite.
- Finish: e.g. Satin finish.
- Size: e.g. 40 mm x 40 mm x 3 mm.

Weather bar:

- Type: e.g. Flat bar.
- Material: e.g. Brass or Anodised aluminium.
- Finish: e.g. Satin finish.
- Size: e.g. 40 mm x 3 mm.

REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS 1379	2007	Specification and supply of concrete
AS 4586	2013	Slip resistance classification of new pedestrian surface materials
AS 4663	2013	Slip resistance measurement of existing pedestrian surfaces
BS 8204		In-situ floor finishes
BS 8204-1	2003	Code of practice for concrete bases and screeds to receive in-situ floorings
ASTM E1155M	2014	Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers

The following documents are mentioned only in the **Guidance text**:

SA HB 197	1999	An introductory guide to the slip resistance of pedestrian surface materials
SA HB 198	2014	Guide to the specification and testing of slip resistance of pedestrian surfaces
CCAA		Cement Concrete & Aggregates Australia
CCAA Data Sheet SRP	2006	Slip resistance of polished concrete surfaces
CCAA Data Sheet SRR	2003	Slip resistance of residential concrete paving surfaces
NATSPEC DES 001	2016	Slip resistance performance
NATSPEC DES 008	2006	Preparation of concrete substrates
NATSPEC GEN 006	2007	Product specifying and substitution
NATSPEC GEN 024	2015	Using NATSPEC selections schedules
NATSPEC TR 01	2019	Specifying ESD
WoodSolutions 48	2018	Slip Resistance and Wood Pedestrian Surfaces.
BS 8204		In-situ floor finishes
BS 8204-3	2004	Code of practice for polymer modified cementitious wearing surfaces
BRANZ Bulletin 389	1999	Concrete Toppings
ACI 302-1R	2015	Guide for concrete floor and slab construction