HEAVY DUTY INDUSTRIAL FLOORING ADVANCED FLOOR ARMOURING

SWAARDIENS NYWERHEIDSVLOERTEËLS GEVORDERDE VLOERBEWAPENING

- High point loading
- Abrasion resistant
- Non-slip
- Steel reinforced
- Heat resistant
- Chemical resistant
- Textured surfaces
- Colour range

Flooring for luggage & freight terminals
Vloerbedekking vir bagasie- en vrageindpunte

Power station heavy duty flooring
Swaardiensvloerbedekking vir kragsentrales

UNION TILES

TEËLS

UNION

TILES

A guide to applications, properties and selection for wherever heavy floor traffic demands a trouble-free floor surface

'n Handleiding tot die aanwending, eienskappe en die keuses waar swaardiensverkeer 'n flatervrye vloerbedekking vereis.

UNION TILES' NEW RANGE OF PRECAST HEAVY DUTY FLOOR TILES AND ADVANCED FLOOR ARMOURING PRODUCTS FOR 'DRY SHAKE' APPLICATION

UNION TEËLS SE NUWE REEKS VOOR-AFGEGIETE SWAARDIENS-VLOERTEËLS EN GEVORDERDE VLOERBEWAPENINGSPRODUKTE VIR 'DROOGSKUD'-AANWENDING

INTRODUCTION
INLEIDING

The demand for better performance from concrete floors in industrial applications led to the development in which a specially formulated cement mixture is applied to the normal concrete floor to give a hard wearing surface layer. After application, time for curing is required for the full strength and other properties to be developed.

Whilst this technique has served the industry well, in the case of floor repairs, the repaired area also requires time for curing which is lost traffic time. This problem has now been overcome by Union Tiles through the development of a range of composite tiles incorporating the hard wearing surface layer.

In addition to this development, Union Tiles has also developed a range of FLOOR ARMOURING SHIELDS to enable the benefits of the special hard setting mixtures to be available for application by the 'Dry Shake' method.

Die behoefte aan beter werkverrigting van betonvloere in nywerheidsgebruik het gelei tot 'n ontwikkeling waar 'n spesiaal voorbereide sementmengsel op die normale betonvloer aangewend word om 'n swaardiens-oppervlaklaag te verskaf. Nadat die mengsel aangewend is, moet dit toegelaat word om te verhard sodat die volle sterkte en ander eienskappe daarvan kan ontwikkel.

Hoewel hierdie tegniek tot dusver goed gewerk het in die nywerheidsopset, het dit in die geval van herstelwerk aan die vloeroppervlak ook 'n sekere tydperk van verharding vereis, wat daartoe gelei het dat die area vir 'n tyd nie gebruik kon word nie. Hierdie probleem is nou deur Union Tile uitgeskakel deur die ontwikkeling van 'n reeks saamgestelde teëls wat die swaardiens-oppervlaklaag inkorporeer.

Hierbenewens het Union Tile ook 'n reeks VLOERBEWAPENINGSKILDE ontwikkel sodat die voordele verbonde aan die spesiale hardestolmengsels ook beskikbaar is vir aanwending by wyse van die 'droogskud'-metode.

Composite floor tiles for heavy duty applications
Saamgestelde vloerteëls vir swaardiens-aanwending

The composite tile has a normal concrete base topped by a 6,0 mm thick super hard layer which provides the increased resistance to abrasion, the extra load carrying capacity, and the high density required for resistance to corrosive liquids.

Tile manufacture is a largely automated process and therefore not susceptible to human error and the consistency of the surface layer properties and dimensions is assured.

Die saamgestelde teël bestaan uit 'n normale betonbasis wat bedek is met 'n buitengewone harde laag van 6,0 mm wat bykomende weerstand bied teen verweer en bestand is teen 'n ekstra swaar dravrag, terwyl dit ook die hoë digtheid verskaf om dit bestand te maak teen bytende vloeistowwe.

Teëlvervaardiging is by uitstek 'n geoutomatiseerde proses en daarom nie blootgestel aan menslike foute nie. Die konsekwensie van die oppervlaklaag se eienskappe en afmetinge is dus verseker.

Flooring for engineering workshops
Vloerbedekking vir ingenieurswerkswinkels

BENEFITS
VOORDELE

- **Durability** - surpassing any other floor tile or finish with a life expectancy in excess of twice that of the normal 30 MPa industrial floor, thus making them extremely cost effective.
- **Duursaamheid** - dit oortref dié van enige ander teël of afwerking en het 'n verwagte lewensduur van twee keer dié van normale 30 MPa-nywerheidsvloere, wat dit uiters kostedoeltreffend maak.
- **Strength** - a wearing surface of 6,0 mm in depth, with metallic or mineral particles combined with either Portland or Aluminous cement, hydraulically pressed under a minimum of 100 tons pressure. The tiles are supplied fully cured, able to take immediate wear from steel wheeled trolleys, hobnailed boots, steel skids, etc.
- **Sterkte** - 'n dra-oppervlak wat 6,0 mm dik is, met metaal- of mineraalgreintjies wat met óf Portlandsement óf aluinagtige sement gemeng en dan onder 'n minimumdruk van 100 ton hidroulies saamgepers word. Die teëls word ten volle verhard verskaf, wat beteken dat dit onmiddellik aangewend kan word in areas waar staalwieltrollies, spykerskoene, staalsleë, ens. gebruik word.
- **Resistance to chemical attack**
  In the case of the Alurok range, these tiles are resistant to many substances normally aggressive to ordinary Portland cement. For example:-
  Dilute mineral acids (beer)
  Mineral salts (sewage water)
  Chlorides (vegetable oils)
  Pure & acid waters (lead, zinc and aluminium)
  Sugary & acidic juices (resistance not absolute, but still better than Portland cement)
  Sulphides
  Calcium bisulphate (dairy products)
  NB: Aluminous cement is not the solution to all kinds of chemical attack and cannot be recommended for work in the presence of acids with a pH of less than 5,0, or in prolonged contact with alkaline solutions (sodium and potassium). If in doubt, please consult our Technical Department stating the nature of the aggressive agent, its strength and, if relevant, its ambient temperature.
- **Weerstand teen chemiese verwering**
  Die teëls in die Alurok-reeks is bestand teen verskeie stowwe wat normaalweg erg verwerend op gewone Portlandsement inwerk. Byvoorbeeld:
  Verdunde mineraalsure (bier)
  Mineraalsoute (rioolwater)
  Chloriedes (plantolies)
  Suiwer en suurvormende water (lood, sink, aluminium)
  Suikerbevattende en suuragtige sappe (weerstand is nie algeheel nie, maar nogtans beter as Portlandsement)
  Sulfiede
  Kalsiumbisulfaat (suiwelprodukte)
  LW: Aluinagtige sement bied nie 'n oplossing vir alle soorte chemiese verwering nie en kan nie vir werk in die teenwoordigheid van sure met 'n pH van minder as 5,0, of in verlengde kontak met alkaline-oplossings (natrium en kalium) aanbeveel word nie. Indien u nie seker is nie, kan u gerus met ons Tegniese Departement gesels en die aard van die verwerende stof, die sterkte, en indien van toepassing, die omgewingstemperatuur verskaf.

COMPARISON WITH IN-SITU FLOORING
VERGELYKING MET IN-SITU-VLOERBEDEKKINGS

The advantages of using a precast fully cured tile over the in-situ method of installing similar power floated concrete floor hardening systems are as follows:-

Die voordeel verbonde aan die gebruik van vooraf gegiete ten volle verharde teëls in teenstelling met die bogenoemde in-situ-metode van soortgelyke betonverharde vloerbedekkings is die volgende:

- The in-situ system of applying a surface layer requires 28 days curing time, prior to the floor being trafficable.
- Met die in-situ-metode van vloeroppervlak-aanwending is daar 'n wagtyd van 28 dae voordat die oppervlak hard genoeg is om te gebruik.
- The in-situ systems require curing under difficult site conditions subjected to varying environmental factors, whilst precast tiles are cured in factory controlled conditions to achieve optimum and consistent strength.
- Die in-situ-stelsels vereis verharding onder moeilike terreinomstandighede en wisselende omgewingsfaktore terwyl voorafgegiete teëls onder beheerde fabriekstoestande verhard word om optimale en egalige sterkte te verseker.
- The in-situ method also has the disadvantage of being vulnerable to human error in the application stage. It is extremely difficult to control the thickness of the hard wearing layer (which is applied by hand) and the possible detrimental effects of over-trowelling.
  The precast tiles are manufactured inplant in which all the variables are accurately controlled:-
  - water/cement ratio
  - thickness of hard wearing layer
  - vibration (for increased density
  - moulding pressure (compaction)
- Die in-situ-metode het ook die nadeel dat dit in die aanwendingstadium onderhewig is aan menslike foute. Dit is uiters moeilik om die dikte van die harde oppervlaklaag (wat met die hand aangewend word) te kontroleer, asook die moontlike nadelige gevolge van te veel troffelgebruik.
  Die voorafgegiete teëls word in die fabriek vervaardig waar al die veranderlikes noukeurig gekontroleer word:
  - die verhouding tussen water en sement
  - die dikte van die harde oppervlaklaag
  - vibrasie (vir hoër densiteit)
  - die gietdrukte (kompaktheid)
- The final advantage to be stressed, that precast floor tiles have over the in-situ flooring systems, is the repair and maintenance factor.
  The removal and subsequent replacement of damaged floor tiles has the obvious advantage that, in using precast tiles with the superior properties mentioned, curing time is eliminated which permits immediate use of the floor, resulting in optimum cost effectiveness.
- 'n Ander belangrike voordeel wat voorafgegiete vloerteëls bo in-situ-vloerstelsel het, is dié ten opsigte van herstelwerk en onderhoud.
  Met die verwydering en daaropvolgende vervanging van beskadigde vloerteëls bied die voorafgegiete teëls met die genoemde voortreflike eienskappe die voordeel dat verhardingstye uitgeskakel word. Dit beteken dat die area onmiddellik gebruik kan word, wat dit uiters kostedoeltreffend maak.

UNION TILES FLOOR ARMOURING
UNION TILES-VLOERBEWAPENING

'In-Situ' versus 'Composite Tile' flooring

Whilst the use of pre-cast and cured tiles offers the advantages noted above, Floor Armouring by 'in-situ' methods solves problems in many situations where complex floor areas can be dealt with more easily. Union Tiles offers both options - Pre-Cast and 'In-Situ'.

UNION Floor Armouring Shields are classified into two categories:-
INDAROK (mineral aggregate)
INDAFERRO (metallic aggregate)

Application is by the dry shake method, power floated into a wet concrete surface bed, and is the ideal product for industrial floors which require extra abrasion resistance, impact protection and point loading.

UNION-vloerbewapeningskilde word in twee kategorieë verdeel:
INDAROK (mineraaltoeslag)
INDAFERRO (metaaltoeslag)

Dit word volgens die "droogskud"-metode aangewend en in die nat betonoppervlak ingestryk en is die ideale toepassing vir fabrieksvloere wat bykomende weerstand teen verwering, impak en druklading vereis.

BENEFITS
VOORDELE

- Excellent resistance to abrasion
- Dry shakes can be applied easily at predetermined thicknesses onto the surface of the fresh concrete
- Non-dusting
- Easy to clean and maintain
- Non-slip surface
- Range of colours
- Uitstekende weerstand teen verwering
- Die "droogskud" kan maklik met 'n vooraf bepaalde dikte op die vars betonoppervlak aangewend word
- Stofvry
- Maklik om skoon te maak en te onderhou
- Glipvrye oppervlak
- 'n Verskeidenheid kleure

TYPICAL APPLICATIONS
TIPIESE AANWENDING

Factories, dairies, warehouses, military tank maintenance bays, bakeries, produce markets, ramps, production engineering areas, loading bays, high forklift traffic areas and cold rooms.

Fabrieke, melkeryee, pakkamers, militêre tenksmeringslokale, bakkerye, produktemarkte, opritte, produksieingenieursareas, laaibane, swaar vurkkraanverkeersareas, koelkamers.

PRESENTATION AND APPLICATION
AANBIEDING EN AANWENDING

Indarok and Indaferro are packaged ready for application in 40 kg bags. No additional measuring or mixing of ingredients is permitted on site. Application to be onto a concrete base with a design strength of 25 MPa minimum.

The concrete is to be placed, vibrated, struck off, levelled and allowed to achieve initial set in the plastic phase.

Once bleeding has stopped, two thirds of the total application of the Floor Armouring is dusted evenly onto the concrete.

Once this has absorbed moisture from the concrete it is hand or power floated into the concrete.

Thereafter, the remaining one-third of Floor Armour is dusted evenly on to the wet concrete, at right angles to the first dusitng, and finally hand or power floated to the desired finish. Care should be taken not to over trowel.

Saw cuts should be made 24 to 48 hours after final trowelling.

Indarok en Indaferro word in 40 kg-sakke verpak en is gereed om aangewend te word. Geen bykomende afmeting of 'n gemeng van bestanddele word op die terrein toegelaat nie.

Dit moet op 'n betonbasis met 'n ontwerpsterkte van minstens 25 MPa aangewend word.

Die beton moet gegiet, gevibreer, afgestryk, gelyk gemaak en dan toegelaat word om in die plastiese fase eers te stol.

Sodra al die lug vrygelaat is, word twee-derdes van die totale aanwending van die vloerbewapening egalig op die beton gestrooi. Sodra dit die klamheid van die beton geabsorbeer het, word dit met die hard of met 'n masjien in die beton ingestryk.

Die oorblywende een-derde van die Vloerbewapening word daarna reghoekig met die eerste aanwending egalig oor die nat beton gestrooi, en dan met die hand of met 'n masjien tot die verlangde afwerking ingestryk. Let daarop dat die troffel nie oordadig gebruik word nie.

Saagsnitte moet binne 24 tot 48 uur ná die finale troffelwerk aangebring word.

ARMOURING THICKNESS FOR DUTY REQUIRED
BEWAPENINGSDIKTE VIR VERLANGDE GEBRUIK

Type of traffic Tipe verkeer	Rate of application Aanwendingsmaatstaf kg/m²
Light/moderate Lig/matig	3- 5
Moderate/heavy Matig/swaar	5- 7
Heavy/concentrated Swaar/gekonsentreerd	9-12

Should an even greater thickness of armourplate be considered desirable, for increased abrasion or unusual service conditions, our Technical Department will be available for consultation.

Indien 'n nog dikker bewapening verlang word vir nog meer weerstand teen verwering of vir buitengewone gebruiksomstandighede, is ons Tegniese Departement tot u beskikking vir raad.

OPTIONAL EXTRAS/OPSIONELE EKSTRAS

The information given in the preceding pages concerns products which are 'standard' production within the UNION range of tiling and flooring products.
Deviations from 'standard' are given full consideration however, and these are discussed below under the heading of OPTIONAL EXTRAS.
Various technical aspects are also discussed to inform the reader more fully.

Die inligting van die voorafgaande bladsye het betrekking op 'standaard'-produkte in UNION se reeks teël- en vloerbedekkings.
Afwykings van die 'standaard' sal egter oorweeg word en word onder die opskrif OPSIONELE EKSTAS bespreek.
Verskeie tegniese aspekte word ook bespreek om die leser breedvoeriger in te lig.

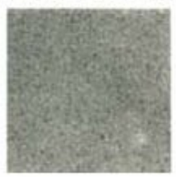
NON-SLIP SURFACES
GLIPVRYE OPPERVLAKKE

Non-slip properties are achieved by impressing the tile surface with dimples or by producing a 'ribbed' surface on the tile. Both of these surface textures are ideal for potentially wet or slippery floor areas.
Glipvrye eienskappe word verkry deur die teëloppervlak met knoppies te bedek of 'n geriffelde oppervlak aan te bring. Albei hierdie oppervlaktekstures is uiters geskik vir areas waar die vloer nat of glipperig kan wees.

RIBBED/GERIB

DIMPLES/MET KNOPPIES

GROUND AND POLISHED SURFACES
GESKUURDE EN GEPOLEERDE OPPERVLAK

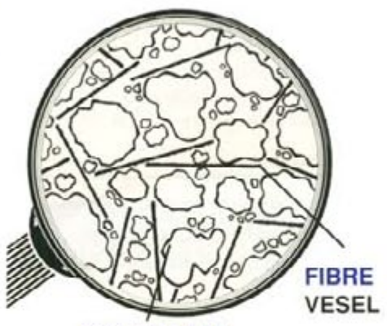


Geskuur en gepoleer

Tiles can be supplied with the top wearing surface finely ground and polished to a smooth texture for use in more prestigious areas, but none the less still require the high performance properties offered by this range of tiles with greater aesthetic value.
Teëls is beskikbaar waarvan die oppervlak fyn geskuur en hoogs gepoleer is. Hierdie teëls met hul gladde tekstuur is vir gebruik in prestige-areas wat nogtans die hoë gebruikseienskappe van hierdie reeks teëls vereis maar wat meer esteties is.

TILE REINFORCEMENT/TEËLVERSTERKING

Extra reinforcement can be achieved by two means - steel fibres or weld-mesh wire.
Bykomende versterking kan op twee maniere verkry word: staalvesel of gesweisde ogiesdraad.



FIBRE
VESEL

AGGREGATE
TOESLAG

STAINLESS STEEL FIBRES
VLERKVRYE STAALVESELS

Attention is drawn to the random orientation of the fibres to ensure that whatever path extra stresses take they are blocked by fibres lying across their path, giving an increase in flexural strength and resistance to point loading.
Let op die lukrake wyse waarop die vesels geplaas is sodat in welke rigting die bykomende las ook al verplaas word, dit deur die vesels ondervang word. Dit bied bykomende fleksiesterkte en weerstand teen gekonsentreerde druk.

GALVANIZED WIRE MESH REINFORCEMENT
GEGALVANISEERDE OGIESDRAADVERSTERKING

HARD LAYER
HARDE LAAG

WIRE MESH REINFORCED BASE
OGIESDRAAD-VERSTERKTE BASIS

TILE BASE MIXTURE
TEËLBASIS MENGSEL

If increased transverse strength is required, a galvanized weld mesh reinforcement can be incorporated into the body of the tile which increases transverse strength by 64%.
Indien bykomende dwarssterkte vereis word, kan 'n gegalvaniseerde ogiesdraadversterking in die romp van die teël ingebou word wat die dwarssterkte met 64% verhoog.

- **Resistance to heat** - the Alurok range is heat resistant up to 500°C and, in the case of the full bodied Alurok, for prolonged periods.
- **Hitteweerstand** - die Alurok-reeks is bestand teen temperature van tot 500°C, en in die geval van verstewigde Alurok vir verlengde periodes.
- **Resistance to Abrasion** - excellent resistance to abrasion, impact and point loading.
- **Skuurweerstand** - uitsonderlike weerstand teen afskuring, impak en puntlading.

PRESENTATION AND APPLICATION
AANBIEDING EN AANWENDING

Tiles are supplied in 303 x 303 x 32 mm and should be laid as follows:

- Before laying commences, the concrete base and tiles must be thoroughly soaked with water and then allowed to dry to a damp surface.
- Both the concrete base and the back of tiles to be slushed with a pure cement slurry and the tile to be bedded in a 3:1 sand/cement mortar mixture.
- Industrial tiles to be laid with a ~~2-3~~ 5-6 mm wide joint to a true top level surface. This joint to be then filled with a liquid grout. (For the Alurok tiles we recommend our High Alumina grout which offers the same resistance properties as the tiles, while for our Indarok/Indaferro tiles we recommend our floor armouring grout which offers the same resistance as the tiles).
- All excess grout to be removed within 1 to 2 hours.

Die teëls se afmetings is 303 x 303 x 32 mm en moet soos volg gelê word:

- Die betonbasis en die agterkant van die teëls moet met 'n suiwer sementbry gesmeer word, en die teëls moet dan in 'n 3:1 sand/sementmengsel gelê word.
- Nywerheidsteëls moet op 'n waterpas oppervlak gelê word met voeë van 2-3 mm tussen die teëls. Hierdie voeë moet dan met 'n vloeibare voegbry opgevul word. (Vir die Alurok-teëls word ons High Aluminia-voegbry aanbeveel aangesien dit dieselfde weerstandseienskappe as die teëls het).
- Alle oortollige voegbry moet binne een tot twee uur verwyder word.

UNION EXTRA HEAVY DUTY PRECAST INDUSTRIAL TILES
UNION SE EKSTRASWAARDIENS-VOORAFGEGIETE NYWERHEIDSTEËLS

TECHNICAL DATA/TEGNIESE DATA

GRADE/GRAAD	28-day compression 28-dag-kompressie sterkte MPa	Depth of penetration Penetrasie-diepte (mm)	28-day density 28-dag densiteit (kg/m³)
25 MPa concrete 25 MPa-beton	27	2,8	2 350
Indarok (mineral aggregate) Indarok (mineraaltoeslag)	85	1,3	2 529
Indaferro (metallic aggregate) Indaferro (metaaltoeslag)	85	0,9	2 538
Alurok (high alumina/natural mineral aggregate) Alurok (hoë alumina/natuurlike mineraaltoeslag)	105	1,3	2 531
Alurok Major (high alumina/klinker aggregate) Alurok Major (hoë alumina/klinker-toeslag)	112	1,1	2 540
Full Bodied Alurok (Alurok Major facing & Alurok backing) Versteweigde Alurok (Alurok Major-voorkant en Alurok-keersy)	112	1,1	2 540

This range is the result of research and development, both on actual sites and in laboratories, and is available in various alternatives with metallic or mineral aggregates, and either Portland cement or high Aluminous cement. The 28-day compressive strength for standard concrete has been used for comparison with the properties achieved with these products.
Hierdie reeks is die gevolg van navorsing en ontwikkeling, beide op terrein en in laboratoriums, en is in verskeie variasies beskikbaar met metaal- en mineraaltoeslag, en óf Portlandsement óf hoogs aluinagtige sement. Die 28-dag-kompressiesterkte vir standaardbeton is gebruik as vergelykende maatstaf vir die verkryging van die eienskappe van hierdie produkte.

TYPICAL APPLICATIONS
TIPIESE TOEPASSINGS

Some examples of where Union Industrial Tiles have been used with success:-

- Factories
- Warehouses
- Bakeries
- Workshops
- Ramps
- Loading Bays
- Cold Rooms
- Meat Processing
- Ablution Blocks
- Power Stations
- Dairies
- Military Tank Maintenance Bays
- Produce Markets
- High Pedestrian Traffic Areas
- Production Engineering Areas
- High Forklift Traffic
- Airport Terminals
- Hotels, Compounds
- Reserve Bank Vaults

Sommige voorbeelde van waar Union se nywerheidsteëls met welslae gebruik is:

- Fabrieke
- Pakhuise
- Bakkerye
- Werkwinkels
- Opritte
- Laaibane
- Koelkamers
- Vleisverwerkingsareas
- Ablusieblokke
- Kragstasies
- Melkerye
- Militêre tenksmeringslokaal
- Produktemarkte
- Swaar voetgangerverkeersareas
- Produksieingenieursareas
- Swaar vurkkraanverkeersareas
- Lughawe-eindpunte
- Hostelle, kampongs
- Reserwebankkluise

ADDITIONAL INFORMATION / BYKOMENDE INLIGTING

ABRASION RESISTANCE
SKUURWEERSTAND

The 'penetration' test quoted in the tabulated products is the most informative test in assessing the resistance to abrasion.
The depth of penetration quoted is obtained from the silicon carbide disc test method for evaluating rates of wear.
The above test, adopted by the Portland Cement Institute, is widely accepted for assessing cement based flooring products.

Die 'penetrasie'-toets waarna in die tabelle verwys word, is die omvattendste om die weerstand teen afskuring te bepaal.
Die penetrasiediepte waarna verwys word, word verkry by wyse van die silikonkarbied-skyftoetsmetode waarvolgens die mate van verwering bepaal word.
Hierdie toets, wat deur die Portland Cement-instituut aanvaar is, word wyd aanvaar vir die waardebepaling van vloerprodukte met 'n sementbasis.

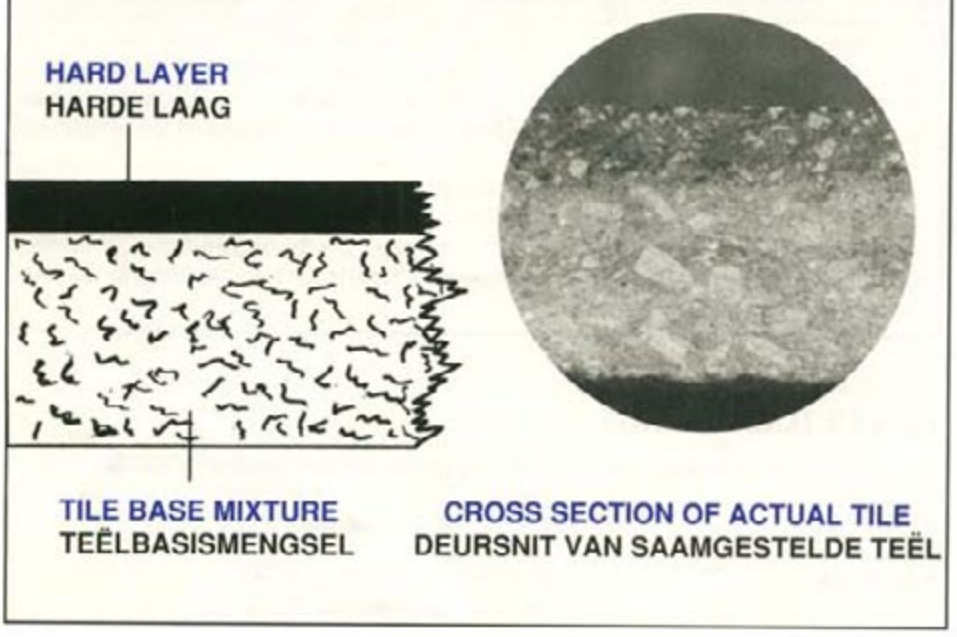
Process plant flooring
Fabrieksvloerbedekking

P.C.I. RATING
P.C.I.-WAARDERING

The P.C.I. rating is:
up to 1,0 mm penetration - Excellent
1,0 - 2,0 penetration - Very good
2,0 - 2,5 penetration - Good

Die P.C.I.-waardering is:
tot 10 mm penetrasie - uitstekend
1,0 - 2,0 penetrasie - baie goed
2,0 - 2,5 penetrasie - goed

THE COMPOSITE TILE / DIE SAAMGESTELDE TEËL



COLOURS
KLEURE

Productivity studies have shown that colour is an important factor in the working environment.
UNION standard products are available in Standard Grey, Black, Red, Yellow, Brown and Green.

Produktiwiteitstudies het getoon dat kleur 'n belangrike rol speel in die werkomgewing.
UNION se standaardprodukte is beskikbaar in Standaardgrys, Swart, Rooi, Geel, Bruin en Groen.

TEËLS
UNION
TILES

UNION FLOORING TILES (PTY) LTD.
P.O. BOX 84, BEDFORDVIEW 2008.

FOUNDER MEMBER OF THE SOUTH AFRICAN TERRAZZO TILE MANUFACTURERS ASSOCIATION

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