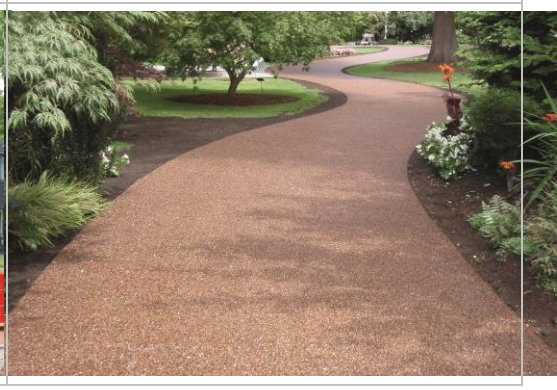
FILTERPAVE®

QUALITY CONTROL DOCUMENT





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FP QC MAY 5, 2014

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Glass Processing Standards

Suppliers approved to supply glass for the FilterPave system must comply with the process standards and specifications identified in this document. Glass must meet the specifications for processing, treatment, particle size and appearance, moisture control, bagging, quality control, storage and shipping.

Glass processing operations certified as FilterPave glass suppliers will be subject to quality control audits.

Glass Processing Equipment

Glass must be cleaned, crushed and dried to conform to the glass material specification. A roller crusher or impact crusher may be used, but the processed glass must be “shard less” with rounded edges and meet the particle size and moisture requirements as identified in the glass material specification.

SOILTEC’s Bonding Agent Treatment

Glass suppliers must treat all supplied glass with an SOILTEC’s Bonding Agent solution purchased from SOILTEC, Germany only. The SOILTEC’s Bonding Agent solution shall consist of 0,4% SOILTEC’s Bonding Agent, with the remainder of the solution being water, and be applied at a 6% ratio to glass weight. The SOILTEC’s Bonding Agent is applied to the processed glass prior to drying. The glass may **not** be heated past 180°C after the SOILTEC’s Bonding Agent solution has been applied to avoid degradation of the SOILTEC’s Bonding Agent. Glass suppliers will keep a project traceable “SOILTEC’s Bonding Agent run log” to show that appropriate amounts of SOILTEC’s Bonding Agent have been applied to any glass run. SOILTEC’s Bonding Agent must be kept above 8°C degrees and used within 48 hours of being mixed with water. Any Amino/water solution older than 48 hours is **not** to be used and shall be discarded. Glass suppliers shall keep an SOILTEC’s Bonding Agent MSDS sheet on file.

SuperSak® Glass Storage Bags

The processed glass must be shipped in SOILTEC approved SuperSaks containing an interior poly liner. The SuperSaks shall be stored indoors out of sunlight and kept dry. Processed glass shall be added to the SuperSaks immediately following processing.

Weight of SuperSaks

The weight of each SuperSak shall be a maximum of 1000 kgs. (+/- 3%)

Temperature of Glass

Temperature of glass is critical to the performance of the FilterPave system. Prior to closure, the temperature of glass within each SuperSak shall be taken to ensure the glass has adequately cooled. The temperature of the glass shall be less than 65°C (150°F) when the liner of the SuperSak is closed.

Moisture of Glass

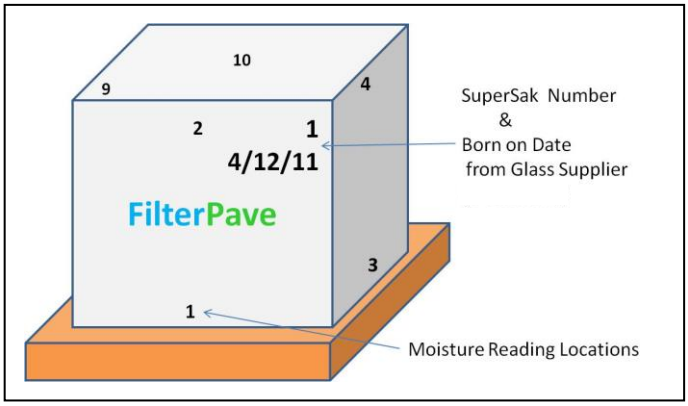
Moisture of glass is critical to the performance of the FilterPave system. Moisture readings of each filled SuperSak shall be taken with a SOILTEC approved moisture meter prior to closing each SuperSak liner. If moisture readings are not acceptable, dry the glass and re-take the readings. With acceptable moisture readings, place a “Born on Date” in 8cm font size written in permanent marker on the front face of the SuperSak.

Immediately preceding a shipment of glass to a project site or contactor location the Glass Supplier shall complete his portion of the Moisture Log following the procedure outlined on the Log.

A SuperSak of glass with average moisture readings of 10% or greater shall be rejected. If any reading is greater than 15% or the average is >10% the glass is not acceptable. If eight readings average 9-11% take two additional readings inside the SuperSak in locations 9 and 10, if either one is above 10% reject that SuperSak from the load.

To ensure accurate individual readings, the probe should be wiped between the moisture readings.

SuperSaks with appropriate moisture content shall be given sequential "SuperSak Numbers" and it shall be written in 8cm font size in permanent marker on the front face of the SuperSak near the "Born on Date". If a project requires more than (16) SuperSaks the sequential numbering shall continue throughout all SuperSaks delivered to the project site. Example; truckload #2 would have SuperSak numbers 17 – 32, and so on.



Closure of SuperSaks

SuperSak liners shall be closed when the temperature and moisture of glass is acceptable. SuperSak liners shall be closed by twisting the inner liner tightly, goose necking, then securing with a Zip Tie. Glass shall not be stored in open SuperSaks. Glass shall be produced and SuperSak liner closed on the same day.

Labeling of SuperSaks

The Glass supplier will print the SuperSak "number #1 thru #XX" and the "Born on date" of the glass with permanent marker in 8cm size font on the front face of each SuperSak to be supplied to a project.

Storing of SuperSaks

SuperSaks must be stored on suitable quality shipping pallets in a dry environment. SuperSaks should not be stored outside or in areas exposed to weather or standing water.

Shipping of SuperSaks

SuperSaks must be shipped on covered watertight flatbed trucks or curtain vans.

Glass Material Specification

Glass approved for use with the FilterPave system must meet the material specification standards outlined below. Glass that does not meet the specification will be rejected and returned to the Glass provider at the Glass provider's expense.

Item	Specification
SOILTEC's Bonding Agent Treated	Glass must be SOILTEC's Bonding Agent treated 6% solution to glass weight.
Glass Particle Size	Shard-less and round-edged glass, 2 - 4,5mm in with 5% fines maximum.
Colors	Mixed, vary by region
Moisture (when bagged)	0-<10%. Bagged glass with 10% average moisture or more will be rejected.
SuperSak	Preprinted with FilterPave logo and 3" hand written SuperSak number and Born on date.
SuperSak Capacity	1000 kgs. (+/- 3%) maximum

Polyurethane (PUR) Material Process & Standards

The polyurethane material used with the FilterPave system consists of Resin and ISO. The polyurethane must be purchased from SOILTEC Geosystems and is manufactured by BASF. Distributor shall keep a MSDS sheet of the polyurethane on file.

Color Pigment

Pigment is added to Resin portion by the contractor on site. Pigment percentage shall be communicated to the distributor by SOILTEC.

PUR Storage

The polyurethane ISO and Resin materials are mainly shipped in 200l drums. Bigger quantities will be shipped in separate water tight containers referred to as totes. Totes and drums must be stored inside according to manufacturer's recommendations below. Colder temperatures below the optimal range may be acceptable, but will adversely affect viscosity. Contact SOILTEC for guidance.

Once totes and drums are unsealed, use approved manufacturer desiccant caps to ensure moisture is not introduced.

PUR/ISO Storage Temperatures:

Polyurethane Component	Optimal Storage Temperature	
Resin	16-27° C	60-80° F
Resin Pigment (all colors)	16-27° C	60-80° F
ISO	16-27° C	60-80° F

PUR/ISO Weights:

Polyurethane Component	Drum Color	Weight	Volume
Resin Drum	Blue	200 kgs.	200l
Resin Tote	N/A	1000 kgs.	1000l
Resin Pigment (all colors)	grey	25 kgs	25l
ISO Drum	Red	230 kgs..	200l
ISO Tote	N/A	1150 kgs	1000l

Contractor/Distributor Materials Process & Standards

Suppliers approved to supply glass for the FilterPave system must comply with the process standards and specifications identified in this document. Glass must meet the specifications for processing, treatment, particle size and appearance, moisture control, bagging, quality control, storage and shipping.

Glass processing operations certified as FilterPave glass suppliers will be subject to quality control audits.

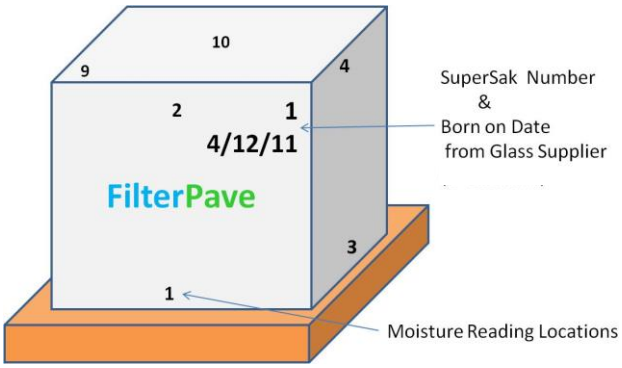
Receipt of Materials

Distributor shall take inventory of incoming PUR totes or drums and SuperSaks and note discrepancies to SOILTEC immediately by contacting Sabrina Luttmann at +49-4202-7670-32 or by e-mail.

Moisture Reading of Glass:

Upon receipt, contractor/distributor shall take SuperSak moisture readings with SOILTEC approved moisture meters. Readings shall be taken of each glass SuperSak in eight locations as identified in the drawing shown on the Moisture Log. Distributor shall note any discrepancies immediately by contacting Sabrina Luttmann at +49-4202-7670-32 or by e-mail.

Glass with average moisture reading of 10% or greater shall be rejected and may be returned to the glass supplier at glass supplier's expense. If any reading is greater than 15% or the average is >10% the glass is not acceptable. If eight readings average 9-11% take two additional readings inside the SuperSak in locations 9 and 10 if either one is above 10% reject the SuperSak.



Completion of Project Moisture Log:

Upon receipt of SuperSaks, contractor must complete the FilterPave Project Warranty Moisture Log and fax or email to SOILTEC in order to be eligible for the 1-Year Materials Warranty.

Storage of Materials

PUR and SuperSaks must be stored on suitable quality shipping pallets in a dry environment. Pallets **should not** be stored outside or in areas exposed to weather or standing water. If SuperSaks are stored for short periods outside, such as for staging at the job site, they must be covered with a water tight tarp and located on high ground. **If glass is stored outside, moisture readings must again be taken prior to the start of the installation.** Glass with moisture average moisture reading of 10% or greater shall be rejected. If any reading is greater than 15% or the average is >10% the glass is not acceptable. If eight readings average 9-11% take two additional readings inside the SuperSak in locations 9 and 10 if either one is above 10% reject the SuperSak.

Resin & ISO Ratios

The Resin to ISO ratio is 1 parts Resin (component A) to 2,5 parts ISO (component B). In large scale operations (non-FP Kit application) the color pigmented Resin will be added to the Resin before mix it with the ISO. The Resin and ISO shall be mixed using a static mixer for at least 3 minutes.

FilterPave™ glue & Glass Ratio

The ready FilterPave® glue (Resin+ISO) are mixed at a 4,2 - 4,4% ratio to glass weight by using a suitable pan-mixer. The mixing time shall not be under 5 minutes. The operator of the pan-mixer must ensure that all glass particles are covered with the FilterPave® glue and that every batch will be completely discharged.

Further details will be found in the installation guidelines or contractor handbook.

Top Coat Material Process & Standards

Top coat may need to be re-applied when pavement needs to be refreshed – especially areas used by cars will need a refreshment after approx.5 years. The top coat material used with the FilterPave system must be supplied from SOILTEC Products Company. The FP Top coat consists is a one component clear (PU) material. Distributor/Contractor shall keep a MSDS sheet of the two parts of the top coat material on file.

Working Time & Temperature

Top coat application is critical to FilterPave system performance. Working time of mixed top coat material is 20-40 minutes before top coat material will begin to set up. If all of pre-mixed top coat not applied within the working time, swelling, cracking & discoloration may result. Plan number of workers to apply all top coat material within working time guidelines *(under normal circumstances, two workers can apply 12kg-drum top coat material within 20 minutes).*

The top coat shall be applied in ambient temperature 15 -30°C (60 - 90°F).

Application Materials

Top coat shall be applied to the cured FilterPave surface evenly by roller. The recommended roller shall have a medium nap. Roller shall be replaced as needed when spreading becomes difficult due to excess material build up on the roller. Dispose of used rollers and equipment in regular trash.

Typical application rate is 50sqm/12kg-drum.

Note; Tape-off and cover walls, plants, objects etcetera that are to be protected from excess splatter!

Application Process

Top coat shall be evenly applied by roller with a medium nap.

The first coat of top coat shall be applied at least 24 hours after the installed FilterPave pavement is cured (3-5 days). Pavement must be free of dirt and debris before applying top coat

OPTIONAL - Color Pigment

The specified color pigment (small beaker) shall be added to the 12kg-drum of the top coat.

Mixing of Top Coat with Pigment

The entire contents of top coat shall be mixed together, scraping edges of color-bucket to ensure all material is added to the mixing bucket. The material shall be stirred, not whipped until the two parts are blended.

Construction Process & Standards

Installation Method

Contractors should follow the installation process outlined in the Contractor Manual. Adherence to temperature and moisture guidelines is critical to the performance of the FilterPave system. Contractor should be prepared with installation and finishing tools.

Installation Clean up

All excess materials should be removed from the project site in a timely fashion. Unused polyurethane and glass should be stored in dry conditions as outlined in PUR Storage in this document.

Inline Testing (not for FP-Kits application)

Distributors/Contractors should submit (1) cylinder at the start and (1) cylinder at the end of each installation day. Distributors/Contractors are responsible to send all samples to a certified testing facility or SOILTEC, Germany following the SOILTEC standards below.

Test Cylinder Preparation

1. Once mix ratio is set, and the pour begins, pour a test cylinder in accordance with the established SOILTEC procedure, listed below, using one of the supplied 10cm diameter, 15cm deep cylinders and send to SOILTEC's certified partner for analysis.
   a. Fill the cylinder 1/3 full and drop on a hard surface, from a height of 8-10cm, 5 times.
   b. Fill the cylinder to 2/3 full and repeat drop from 8-10cm on a hard surface, 5 times.
   c. Fill cylinder to overflowing, compact and screed off with the edge of a 5cm x 10cm or similar item.
2. Average FilterPave compression strength of 800PSI with no results below 700PSI is required for each day's cylinders to be eligible for a Warranty.
3. **Critical: cylinders must be prepared exactly per #1 above.**

Quality Control Records

Quality control records will be maintained by SOILTEC for specific FilterPave process materials, samples and documentation:

- Contractors/Distributors shall complete Project Logs;
  - Moisture Log
  - Compression Test Log

Contractor Handbook List

A master list shall be maintained at SOILTEC of the contractors/distributors who have received a FilterPave Contractor Handbook. The date sent and manual date shall be recorded. The master list shall be maintained in the FilterPave database.

APPENDIX

- **Moisture Log:** FilterPave
- **Compression Test Log:** FilterPave

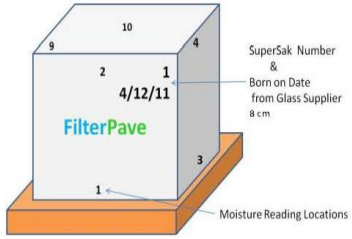
Moisture Log FilterPave: Pg 1

Moisture Log - FilterPave

Today's Date:	
Project Name:	
Project Address:	
SOILTEC Contact:	Phone +49-4202-7670-32 · Fax +49-4202-7670-50 · email: sabrina.luttmann@soiltec.de

1. Glass Supplier assigns SuperSak # and completes Moisture Log and sends to Presto within 24 hrs after shipment date.
2. Contractor completes a Moisture Log and sends to Presto within 24 hr after receiving date.
3. Contractor completes a Moisture Log and sends to Presto within 24 hr after installation date.

If 1-8 readings have an Average of greater than 10% isolate the wet SuperSak and open and take readings 9 & 10.
If readings 9 & 10 are above 10% ... don't use the SuperSak until properly dried. Call Presto and advise plan.



		Moisture % Readings in following Location Number										
		Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top		Inside Corner	Inside Center
SuperSak #		1	2	3	4	5	6	7	8	Ave	9	10
1	Glass Supplier											
1	Contractor - Glass Arrival											
1	Contractor - Day of Glass Install											
2	Glass Supplier											
2	Contractor - Glass Arrival											
2	Contractor - Day of Glass Install											
3	Glass Supplier											
3	Contractor - Glass Arrival											
3	Contractor - Day of Glass Install											
4	Glass Supplier											
4	Contractor - Glass Arrival											
4	Contractor - Day of Glass Install											
5	Glass Supplier											
5	Contractor - Glass Arrival											
5	Contractor - Day of Glass Install											
6	Glass Supplier											
6	Contractor - Glass Arrival											
6	Contractor - Day of Glass Install											
7	Glass Supplier											
7	Contractor - Glass Arrival											
7	Contractor - Day of Glass Install											
8	Glass Supplier											
8	Contractor - Glass Arrival											
8	Contractor - Day of Glass Install											

Last revised: 13.02.2014

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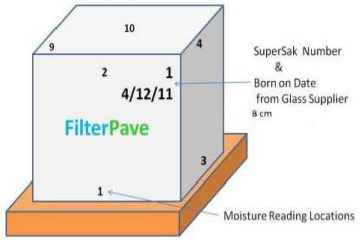
Moisture Log FilterPave: Pg 2

Moisture Log - FilterPave

Today's Date:	
Project Name:	
Project Address:	
SOILTEC Contact:	Phone +49-4202-7670-32 - Fax +49-4202-7670-50 - email: sabrina.luttmann@soiltec.de

1. Glass Supplier assigns SuperSak # and completes Moisture Log and sends to Presto within 24 hrs after shipment date.
2. Contractor completes a Moisture Log and sends to Presto within 24 hr after receiving date.
3. Contractor completes a Moisture Log and sends to Presto within 24 hr after installation date.

If 1-8 readings have an Average of greater than 10% isolate the wet SuperSak and open and take readings 9 & 10.
If readings 9 & 10 are above 10% ... don't use the SuperSak until properly dried. Call Presto and advise plan.



		Moisture % Readings in following Location Number										
		Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top		Inside Corner	Inside Center
SuperSak #		1	2	3	4	5	6	7	8	Ave	9	10
9	Glass Supplier											
9	Contractor - Glass Arrival											
9	Contractor - Day of Glass Install											
10	Glass Supplier											
10	Contractor - Glass Arrival											
10	Contractor - Day of Glass Install											
11	Glass Supplier											
11	Contractor - Glass Arrival											
11	Contractor - Day of Glass Install											
12	Glass Supplier											
12	Contractor - Glass Arrival											
12	Contractor - Day of Glass Install											
13	Glass Supplier											
13	Contractor - Glass Arrival											
13	Contractor - Day of Glass Install											
14	Glass Supplier											
14	Contractor - Glass Arrival											
14	Contractor - Day of Glass Install											
15	Glass Supplier											
15	Contractor - Glass Arrival											
15	Contractor - Day of Glass Install											
16	Glass Supplier											
16	Contractor - Glass Arrival											
16	Contractor - Day of Glass Install											

Last revised: 03.02.2014

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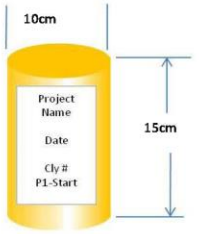
Compression Test Log: FilterPave

Compression Test Log - FilterPave

Today's Date:	
Project Name:	
Project Address:	
SOILTEC Contact:	Phone +49-4202-7670-32 - Fax +49-4202-7670-50 - email: sabrina.luttmann@soiltec.de



1. **Contractor to provide** Test Cylinders, Compression Test Samples and Testing at a local certified test lab.
2. **Contractors to make (1) cylinder at the start and (1) cylinder at the end of each continuous pour.**
3. **Contractor to mark Test Clylinders with** Project Name, Date and as P# - Start or P#- End.
4. **Contractor to complete** Compression Test Log and return to Presto to be eligible for a Project Warranty Document.

Continuous Pour Number	Pour Date	Compression fail (PSI) First Sample Cylinder		Compression fail (PSI) End Sample Cylinder		Notes
1		P1 -Start:		P1 - End:		
2		P2 -Start:		P2 - End:		
3		P3 -Start:		P3 - End:		
4		P4 -Start:		P4 - End:		
5		P5 -Start:		P5 - End:		

Contractors are responsible to send all cylinders to a certified testing facility for Compression Testing.

Test Cylinder Preparation
1. Once mix ratio is set, and the pour begins, pour a test cylinder in accordance with the established Presto procedure listed below.
Using a 10cm diameter x 15cm deep concrete test cylinder;
a. Fill the cylinder 1/3 full and drop on a hard surface, from a height of 8-10cm, 5 times.
b. Fill the cylinder to 2/3 full and repeat drop from 8-10cm on a hard surface, 5 times.
c. Fill cylinder to over flowing, compact and screed off with a 5cm x 10cm or similar item.
d. Cylinders should laboratory cured for 7 days in dry ambient air conditions.
2. Average FilterPave compression strength of 800PSI with no results below 700PSI are required for each day's cylinders to be eligible for a Warranty.
3. Critical: cylinders must be prepared exactly per #1 above.

Last revised: 03.02.2014