



HACCP-analysis and plan for:

- **BECOSAN Combi**
- **BECOSAN Densifier Flash**
- **BECOSAN Densifier**
- **BECOSAN Protective Sealer**

Introduction

The Danish company, BECO TREAT ApS, hereinafter referred to as BECOTREAT, produces and delivers a variety of products for concrete floors. The purpose of the products is to increase the strength of the floors. BECOTREAT has developed and implemented a quality management system and obtained a quality management system certificate according to ISO 9001 December 2015.

The products penetrate much faster and bind pores more complete than conventional concrete densifiers. The chemical reaction produces a denser concrete surface, which reduces abrasion wear and dust formation, it is water repellent and protects against oils, grease and chemicals. The products are water based and do not contain epoxy or isocyanates.

The products are listed below:

1. BECOSAN Combi

Recommended for: All concrete surfaces.

- Hardens and dustproof concrete surfaces.
- Protects concrete floor against water, oil and grease.
- Improves floors in warehouses, factories, industrial locations, car parks, etc.

2. BECOSAN Densifier Flash

Recommended for: All concrete surfaces. Also suitable for soft or not completely cured concrete surfaces.

- Hardens and dustproof concrete surfaces.
- Excellent resistance against chemicals. Improve floors in warehouses, factories, industrial locations, car parks, etc.

3. BECOSAN Densifier

Recommended for: All concrete surfaces.

- Hardens and dustproof concrete surfaces.
- Excellent resistance against chemicals.
- Improve floors in warehouses, factories, industrial locations, car parks, etc.

4. BECOSAN Protective Sealer

Recommended for: All mineral surfaces like natural stone, concrete floors and slabs, clay tiles, terracotta floorings, slate, etc.

- Improves the functionality, appearance and look of mineral surfaces.
- Increased life span.
- Easy to keep clean and protected with minimal effort.
- UV-stable.
- Will not yellow or change the original look of the surface.

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1. Legal demands related to the products

1.A Food processing hygiene

The products are to be used in the food processing industry. This means that there are a number of legal demands related to hygiene.

In Europe, the general demands are described in: REGULATION (EC) No 853/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2004 on the hygiene of foodstuffs. The demands are rather general:

Annex II states:

- "1. Food premises are to be kept clean and maintained in good repair and condition.*
- 2. The layout, design, construction, siting and size of food premises are to:*
 - (a) permit adequate maintenance, cleaning and/or disinfection, avoid or minimise air-borne contamination, and provide adequate working space to allow for the hygienic performance of all operations;*
 - (b) be such as to protect against the accumulation of dirt, contact with toxic materials, the shedding of particles into food and the formation of condensation or undesirable mould on surfaces;*
 - (c) permit good food hygiene practices, including protection against contamination and, in particular, pest control;"*

AND:

"In rooms where food is prepared, treated or processed (excluding dining areas and those premises specified in Chapter III, but including rooms contained in means of transport) the design and layout are to permit good food hygiene practices, including protection against contamination between and during operations. In particular:

- 1. (a) floor surfaces are to be maintained in a sound condition and be easy to clean and, where necessary, to disinfect. This will require the use of impervious, non-absorbent, washable and non-toxic materials unless food business operators can satisfy the competent authority that other materials used are appropriate. Where appropriate, floors are to allow adequate surface drainage."*

This is not particularly informative in terms of selecting the best floor material, though it defines some basic needs:

- Floors should be robust and cleanable.
- Floors should not emit or release contaminants.
- Floors should be designed in order to prevent growth of microbiological risks.

The Codex Alimentarius guideline for Food Hygiene 4.th edition (WORLD HEALTH ORGANIZATION FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS Rome, 2009), repeats these general demands:

"4.2 Premises and rooms

4.2.1 Design and layout *Where appropriate, the internal design and layout of food establishments should permit good food hygiene practices, including protection against cross-contamination between and during operations by foodstuffs.*

4.2.2 Internal structures and fittings *Structures within food establishments should be soundly built of durable materials and be easy to maintain, clean and, where appropriate, able to be disinfected. In particular, the following specific conditions should be satisfied, where necessary, to protect the safety and suitability of food:*

the surfaces of walls, partitions and floors should be made of impervious materials with no toxic effect in intended use;

walls and partitions should have a smooth surface up to a height appropriate to the operation;

floors should be constructed to allow adequate drainage and cleaning;

ceilings and overhead fixtures should be constructed and finished to minimize the build-up of dirt and condensation, and the shedding of particles;

windows should be easy to clean, be constructed to minimize the build-up of dirt and, where necessary, be fitted with removable and cleanable insect-proof screens. Where necessary, windows should be fixed;

doors should have smooth, non-absorbent surfaces, and be easy to clean and, where necessary, disinfect;

working surfaces that come into direct contact with food should be in sound condition, durable and easy to clean, maintain and disinfect. They should be made of smooth, non-absorbent materials, and inert to the food, to detergents and disinfectants under normal operating conditions."

The European Commission has issued a Guidance document on the implementation of certain provisions of Regulation (EC) No 853/2004 On the hygiene of foodstuffs. This guidance does address floors, but only in terms of the documentation that a business operator might need to send to the appropriate authority to document compliance with the food hygiene legislation:

"8.2. Although not required by the Regulation, it may be good practice for food business operators to establish also other documentation that could assist in meeting the objectives of the Regulation. In establishing such documentation, food business operators may wish to take account of the following:

Documentation on structural requirements

Documentation may relate to structural requirements in order to clarify a number of requirements of a general nature contained in the Regulation, such as:

- Annex II, Chapter II, point 1, (a) and (b), where the surfaces of floors and wall are required to be "of impervious, non-absorbent, washable and non-toxic materials unless food business operators can satisfy the competent authority that other materials used are appropriate", and (f), where the surfaces in general are to be of "smooth, washable, corrosion-resistant and non-toxic materials, unless food business operators can satisfy the competent authority that other materials used are appropriate".
- Annex II, Chapter III, point 2(b), where the surfaces in contact with food are required to be of "smooth, washable, corrosion-resistant and non-toxic materials, unless food business operators can satisfy the competent authority that other materials used are appropriate."

Thus, the business operator of a food processing company may need to document that the floors chosen for the factory are appropriate. This means that the supplier of floors need to address the legal demands and produce the necessary documentation.

The World Union of Wholesale Markets, European Regional Section has issued a Community guide to good hygienic practices specific to the wholesale market management in the European Union (WUWM November 2009).

This guide explains more detailed the demands related to food processing factories:

"Permit adequate maintenance, cleaning and/or disinfection, avoid or minimise air-borne contamination, and provide adequate working space to allow for the hygienic performance of all operations;

Materials used for construction should allow for the type of cleaning appropriate to the area. The layout and design of food premises should allow access for cleaning to all parts of the premises. The design, construction and surface finishes within food premises determine how easily they can be cleaned.

The wholesale market management and/or food businesses responsible should ensure that adequate systems and precautions are in place to prevent adverse chemical reactions occurring between cleaning products and/or construction materials.

Colours and materials should be appropriate for food use.

It is essential that the correct materials are chosen for all ceiling, wall and floor finishes and that they are properly fixed or applied.

Be such as to protect against the accumulation of dirt, contact with toxic materials, the shedding of particles into food and the formation of condensation or undesirable mould on surface;

The inside layout of the premises should prevent the accumulation of dirt in places which are inaccessible to cleaning. Existing buildings should be maintained as appropriate, e.g. minimise ledges.

Construction materials should not contain any substance which may add toxic material to food either directly or indirectly.

Design and construction, especially of high-level surfaces, should avoid finishes that may lead to the shedding of particles such as flaking paint, plaster and such like.

Wall and floor junctions should be covered (with concave mouldings) to facilitate intensive cleaning. When refurbishing or renovating all ledges should be suppressed, if possible.

Floor surfaces are to be maintained in a sound condition and be easy to clean and, where necessary, to disinfect. This will require the use of impervious, non- absorbent, washable, and non-toxic materials unless food business operators can satisfy the competent authority that other materials used are appropriate. Where appropriate for the operations unless food business operators can satisfy the competent authority that other materials used are appropriate;

All surfaces should be non-slip. Materials such as flooring tiles, vinyl seamless safety flooring, terrazzo, epoxy resin, granolithic, etc. may be used, but in all cases they should be perfectly sealed.

Floors should be designed to prevent water lying or pooling. Where there may be significant spillage or where wet cleaning is used, floor drains may be provided. Floors levels should fall towards the floor drains."

The European Hygienic Engineering and Design Group (EHEDG) has issued a special guideline for European Hygienic Engineering and Design Group (EHEDG document no. 8, April 2004). Even though this guide addresses machinery, it provides two relevant definitions:

Non-toxic construction materials

Materials which, under the conditions of intended use, do not release toxic substances.

Non-absorbent materials

Materials which, under the conditions of intended use, do not internally retain substances with which they come into contact.

The US legislation i.e.: 9 CFR 416.2 is more or less alike - the same general demands regarding hygiene.



Modern legislation uses the development and application of standards as a way of defining more specific demands for specific products or defining test methods for documentation of compliance. Though there are several standards related to resilient floorings and paints, there are no standards related to a product which is not a resilient flooring or a surface coating. This means that there are ready-made ways of documenting compliance for the products from BECOTREAT. Thus, a special test plan has been defined.

Additionally, it has to be mentioned that Codex Alimentarius has issued a CODE OF PRACTICE CONCERNING SOURCE DIRECTED MEASURES TO REDUCE CONTAMINATION OF FOOD WITH CHEMICALS (CAC - RCP 49-2001).

Whereas this code of practice focuses on more direct ways of chemical contamination of food, it maintains that:

“Food production, processing and preparation operations should be analysed with a view to identifying hazards and assessing the associated risks. This should lead to a determination of critical control points and the establishment of a system to monitor production at these points (i.e. the Hazard Analysis Critical Control Point or “HACCP” approach). It is important that care is exercised throughout the whole production-processing and distribution chain, since food safety and quality in other respects cannot be “inspected into” the product at the end of the chain.”

This means that producers of equipment and facilities for food processing industries have to consider the kinds of cleaning agents needed because of their choice of materials or design. In other words: One might argue that producers of equipment and facilities for food processing industries are obliged to consider if their choice of materials or design might result in the use of hazardous cleaning agents that may constitute a risk of chemical contamination of the food. If this is the case, the producers of equipment and facilities are obliged to try to substitute the materials or change the design in order to reduce the use of hazardous cleaning agents.

Food processing facility floors are exposed to:

- Vegetable oils
- Animal fats
- Dairy products
- Sugar
- Salts
- Alkaline compounds
- All kinds of food processing chemicals as well as additives
- Cleaning agents
- Chlorine
- Disinfectants
- Solvents
- Physical damages from steel-wheeled carts, dragged crates, forklifts, etc.
- Humidity
- Extreme temperatures

Thus, BECOTREAT has defined the following test plan:

Legal demand	Documentation
Smooth	The products have been tested by two different testing laboratories and found to be in accordance with demands for industrial floors.
Washable	The products can be washed and cleaned with any usual industrial cleaning agent; preferably a pH neutral cleaning agent. Thus no hazardous cleaning agents are needed.
Non-toxic materials It is generally not allowed that food contact materials contain substances classified as toxic, carcinogenic, mutagenic or toxic to reproduction. Whereas industrial floorings are not defined as food contact materials it still seems logical to use the same demands for the floorings.	No ingredient is classified as toxic, carcinogenic, mutagenic or toxic to reproduction according to REACH or CLP. The products consist of a mixture of non-classified chemical substances and maximum 20 vol. % of a chemical substance classified as: H315: Causes skin irritation. H319: Causes serious eye irritation. See section 1.b of this document for more information
Impervious	In-house testing according to test plan of BECOSAN-treated concrete supplied by external documentary testing. Tests include: <ul style="list-style-type: none"> • Vegetable oils • Animal fats • Dairy products • Sugar • Salts • Alkaline cleaning agents • Strong acids • Colouring agents • Chlorine • Cleaning agents • Disinfectants • * Solvents
Non-absorbent	See above.
Prevent adverse chemical reactions occurring between cleaning products and/or construction materials.	See above.
Colours should be appropriate for food use	Stains and leakage has to be easily seen on the floor - most BECOTREAT products are colourless.
Properly fixed and applied	Manuals and instructions for applicators
Protect against the accumulation of dirt	This is a matter of smoothness and lack of joint and seams.
Protect against the shedding of particles	Testing of BECOSAN-treated concrete to document resistance to tear and wear.
Protect against the formation of condensation or undesirable mould on surface	Testing of BECOSAN-treated concrete regarding microbiological resistance.

Moreover, most food processing factories demand that the floor has a certain lifetime as it is difficult and costly to replace the floorings. BECOSAN-treated floors can be refreshed by using the refresher product, thus BECOSAN-treated floors do not have to be replaced as often as usual industrial floorings.

Results from the in-house testing related to food hygiene

Tests were completed January 2017. Tests were accomplished by applying different food substances on concrete floor surfaces. The surfaces were previously treated with BECOSAN Densifier and BECOSAN Protective Sealer.

The following food substances were used:

- Blood
- Olive Oil
- Blueberry Juice
- White Spirit
- Red Cabbage
- Margarine
- Boiling water
- Red berry Juice
- Ketchup
- Chlorine

The substances were left on the concrete surface for two hours like this:



After two hours the food substances were cleaned using different cleaning and disinfecting agents typically used in the Food Processing Industry. The following cleaning agents were used:

- Nova clean - a typical all-purpose cleanroom cleaner
- Suma Bac D. 10. - a typical one-step liquid disinfectant for the Food Processing Industry
- Suma Chlorosan D.10.4 - a typical chlorinated disinfectant and cleaning agent for the Food Processing Industry
- Desinfect Maxi - a typical disinfectant foam for the Food Processing Industry
- Lime acid - a typical acidic cleaning agent or foam for the Food Processing Industry.

The testing documented that lime acid damaged the concrete surface; thus it was decided not to go any further with this particular cleaning agent/disinfectant.

The cleaning agents were applied to the surfaces as recommended by the producer - i.e.: Usual concentration, recommended working time and recommended application methods.

After cleaning, the surfaces were visually inspected to evaluate:

- Damages to the surface
- Stain removal

As regards damages to the surface no damages were accepted. This means: If the concrete surface was damaged by any food substance or cleaning agent, BECOTREAT would have to warn customers against this specific usage. That is why the use of lime acid as cleaning agent is not recommended.

As regards stain removal, stains were defined as any visible change of colour on the concrete surface. Thus, it turned out that olive oil and margarine left a shadow - a slightly darker stain - regardless of the cleaning agent used. No doubt, the stain is clean and as sound as it was before the test, but there is a visible shadow. Thus, it was decided to recommend that fatty food substances ought to be washed away from time to time.

The results are shown below:

Food Substance	Stain removal result (after cleaning with following cleaning agents)			
	Novaclean	Suma Bac D.10	Suma Chlorosan D.10.4	Desinfect Maxi
Blood	100%	100%	100%	100%
Olive Oil	80%	80%	80%	80%
Blueberry juice	100%	100%	100%	100%
White Spirit	100%	100%	100%	100%
Red cabbage	100%	100%	100%	100%
Margarine	85%	85%	85%	85%
Boiling Water	100%	100%	100%	100%
Red berry juice	100%	100%	100%	100%
Ketchup	100%	100%	100%	100%
Chlorine	100%	100%	100%	100%



As a result of these in-house tests, BECOTREAT has decided to market the tested floor products for the use in the Food Processing Industry and in warehouses for the Food Processing Industry with the following warnings:

Do not use strong acidic cleaning agents or disinfectants. Fatty substances like oil, butter and margarine ought to be washed away from time to time during the production.

1.B Chemical legislation

The products are chemical products. Thus, it is mandatory to demonstrate compliance with:

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (REACH).

and

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (CLP).

Whereas the REACH regulation defines the rules of classification of chemical substances and bans or restricts the use of certain substances (Substances of Very High Concern for instance), the CLP regulation demands that the producer issues a material safety data sheet (MSDS) based on a risk assessment of the foreseen use of the product.

The products from BECOTREAT do not contain any SVHC's as can be seen from the list below:

BECOTREAT Product	Ingredient	Classified as	SVHC?	CMR?	VOC	Hazardous to environment?
BECOSAN Combi	Modified Lithium Silicate Polymer	H315: Causes skin irritation. H319: Causes serious eye irritation.	No	No	No	No
BECOSAN Densifier Flash	Modified Lithium Silicate Polymer	H315: Causes skin irritation. H319: Causes serious eye irritation.	No	No	No	No
BECOSAN Densifier	Modified Lithium Silicate Polymer	H315: Causes skin irritation. H319: Causes serious eye irritation.	No	No	No	No
BECOSAN Protective Sealer	Modified Polymer	No classification required	No	No	No	No



1.C Legislation related to construction products

The products from BECOTREAT are construction products. As such they need to comply with REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

This regulations states that construction products have to comply with a set of basic requirements defined in Annex 1 of the regulation. These basic requirements are “translated” into a variety of European standards. When a relevant European standard has been published producers are obliged to demonstrate compliance with the regulation using this or these standards. Compliance is demonstrated by a CE-labelling of the product and the issuing of a declaration of performance.

All products have been tested are in compliance with the following standards:

- EN 1504-2 2005
- EN 1504-9 2010
- EN 1504-10 2006

The declarations of performance can be found in chapter 9.

2. Identifying the products and the producer

Product Category Description

Product:

1. Common Name/Description

- BECOSAN Combi
- BECOSAN Densifier Flash
- BECOSAN Densifier
- BECOSAN Protective Sealer

2. How is it to be used?

The purpose of the products is to increase the strength of the floors. The products penetrate much faster and bind pores more complete than conventional concrete densifiers. The chemical reaction produces a denser concrete surface, which reduces abrasion wear and dust formation, it is water repellent and protects against oils, grease and chemicals.

3. Type of Package

25 litres can

4. Length of Shelf Life; At what temperature?

24 months at minimum 5°C.

5. Where will it be sold?

Through global gents to professional applicators.



6. Labelling instructions



Warning:

H315: Causes skin irritation. H319: Causes serious eye irritation.

P262: Do not get in eyes, on skin, or on clothing.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

7. Is special distribution control needed?

Yes - only to be sold to professional applicators who are introduced to the products by the global agents.

Main Ingredients:

Lithium silicate, CAS no: 12627-14-4

Other Ingredients

A mixture of non-classified chemical substances

Restricted Ingredients

None

Packaging Materials

Polyethylene

Casings

NA

Flow Chart

1. Product development at BECOTREAT according to specified procedure.
2. Product testing according to specifications in HACCP Analysis. Test of applications.
3. Product labelling and manual for application.
4. Production. All batches are traceable. All batches are tested.
5. Marketing and sales.
6. Project advice and monitoring- BECOTREAT sales offices - not all projects, but BECOTREAT demands that a BECOTREAT sales office is involved in decision-making processes regarding the choice of products when new or unknown risks are identified.
7. Instruction of applicators.
8. Application.
9. Monitoring of application results - certain projects by a BECOTREAT sales office.
10. Handling of non-compliances and customer claims.
11. Monitoring and revision of HACCP analysis and plan.

3. HACCP Analysis

Process Step	Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical	Should the hazard be addressed in the HACCP plan?	Justification for decision	What control measures can be applied to prevent the significant hazards?
1. Preparing the existing floor for treatment with the products	P, B and C The existing floor has to be concrete suitable for industrial floors	Yes	If the concrete is not the right type, the treating may not result in a floor suitable for food processing industries	The applicator needs to get documentation from the customer related to the floor materials used. Surfaces must be clean, dry and absorbent. Confirm surface absorbency with a light water spray - surfaces designated for treatment should wet uniformly. Remove fat, oil and curing agents before use.
2. Application of the product	P, B and C The product to be distributed and saturated evenly and at a minimum temperature of 5°C	Yes	If the product is not distributed and saturated evenly, the resulting may end up having non-treated areas	For application use a low-pressure pump and distribute evenly and saturated with a mop. Avoid sagging and puddles and keep the surface wet for a minimum of 15 minutes - re-apply if necessary on non-saturated areas. A minimum temperature of 5 °C is required for the application.
3. Drying and hardening	B, C and P Correct temperature and time is needed in order to ensure drying and hardening	Yes	If the temperature is below 5°C, the hardening and drying is not going to be efficient	Drying time: 30 - 60 minutes under average conditions
4. Design of application in order to avoid joints and seaming	B, C and P The product to be distributed and saturated evenly and at a minimum temperature of 5°C	Yes	If the product is not distributed and saturated evenly, the resulting may end up having non-treated areas	For application use a low-pressure pump and distribute evenly and saturated with a mop. Avoid sagging and puddles and keep the surface wet for a minimum of 15 minutes - re-apply if necessary on non-saturated areas. A minimum temperature of 5 °C is required for the application.
5. Use of the floor - industrial traffic	P - followed by C and B If the floor is not maintained, it will - sooner or later start to erode	Yes	If the floor is not maintained, it will - sooner or later start to erode	A plan for maintenance is necessary in order to maintain the performance of the floor
6. Use of the floor spillage of food and raw materials	P - followed by C and B If the spillage is allowed to stay on the floor for a prolonged time, the lifetime of the floor will diminish	Yes	The floor has been tested in order to ensure that it is suitable for a various number of food and raw materials. The floor has been tested exposing the treated floor for 20 minutes and 20 hours. If spillage is removed within the first 20 minutes, the influence of the spillage to the floor is practically non-existent. If the floor is exposed to spillage for several hours, the lifetime of the floor will diminish.	Instruction to the customer related to spillage are necessary

Process Step	Potential hazard introduced, controlled or enhanced at this step B= Biological C= Chemical P= Physical	Should the hazard be addressed in the HACCP plan?	Justification for decision	What control measures can be applied to prevent the significant hazards?
7. Cleaning of the floor - exposure to cleaning agents	P followed by B and C If the cleaning with disinfectant agents are allowed to stay on the floor for a prolonged time, the lifetime of the floor will diminish	Yes	The floor has been tested in order to ensure that it is suitable for a various number of cleaning agents and disinfectants. The floor has been tested exposing the treated floor for 20 minutes and 20 hours. If cleaning agents and disinfectants are removed within the first 20 minutes, the influence of the spillage to the floor is practically non-existent. If the floor is exposed to spillage for several hours, the lifetime of the floor will diminish	Instruction to the customer related to cleaning and disinfection routines are necessary
8. General maintenance	P - followed by C and B If the floor is not maintained, it will - sooner or later start to erode	Yes	If the floor is not maintained, it will - sooner or later start to erode	A plan for maintenance is necessary in order to maintain the performance of the floor

4. Identifying critical control points

Process Step	Hazard	Q1. Does this step involve a hazard of sufficient risk and severity to warrant its control?	Q2. Does a preventive measure for the hazard exist at this step?	If Q2 is no: is control at this step necessary for safety?	Q3. Is control at this step necessary to prevent, eliminate or reduce the risk of the hazard to consumers?	CCP
1. Preparing the existing floor for treatment with the products	P, B and C The existing floor has to be concrete suitable for industrial floors	Yes	Yes		The applicator needs to get documentation from the customer related to the floor materials used. Surfaces must be clean, dry and absorbent. Confirm surface absorbency with a light water spray - surfaces designated for treatment should wet uniformly. Remove fat, oil and curing agents before use.	GMP

Process Step	Hazard	Q1. Does this step involve a hazard of sufficient risk and severity to warrant its control?	Q2. Does a preventive measure for the hazard exist at this step?	If Q2 is no: is control at this step necessary for safety?	Q3. Is control at this step necessary to prevent, eliminate or reduce the risk of the hazard to consumers?	CCP
2. Application of the product	P, B and C The product to be distributed and saturated evenly and at a minimum temperature of 5°C	Yes	Yes		For application use a low-pressure pump and distribute evenly and saturated with a mop. Avoid sagging and puddles and keep the surface wet for a minimum of 15 minutes - re-apply if necessary on non-saturated areas. A minimum temperature of 5 °C is required for the application.	GMP
3. Drying and hardening	B, C and P Correct temperature and time is needed in order to ensure drying and hardening	Yes	Yes		B, C and P Correct temperature is needed in order to ensure drying and hardening	GMP
4. Design of application in order to avoid joints and seaming	B, C and P The product to be distributed and saturated evenly and at a minimum temperature of 5°C	Yes	Yes		For application use a low-pressure pump and distribute evenly and saturated with a mop. Avoid sagging and puddles and keep the surface wet for a minimum of 15 minutes - re-apply if necessary on non-saturated areas. A minimum temperature of 5 °C is required for the application.	GMP
5. Use of the floor - industrial traffic	P - followed by C and B If the floor is not maintained, it will - sooner or later start to erode	Yes	Yes		A plan for maintenance is necessary in order to maintain the performance of the floor	GMP
6. Use of the floor spillage of food and raw materials	P - followed by C and B If the spillage is allowed to stay on the floor for a prolonged time, the lifetime of the floor will diminish	Yes	Yes		Instruction to the customer related to spillage are necessary	GMP
7. Cleaning of the floor - exposure to cleaning agents	P followed by B and C If the cleaning and disinfectant agents are allowed to stay on the floor for a prolonged time, the lifetime of the floor will diminish	Yes	Yes		Instruction to the customer related to cleaning and disinfection routines are necessary	GMP
8. General maintenance	P - followed by C and B If the floor is not maintained, it will - sooner or later start to erode	Yes	Yes		A plan for maintenance is necessary in order to maintain the performance of the floor	GMP



5. Critical limits, monitoring and corrective actions

As all of the identified risks are categorized as GMPs the basic instructions for applicators and customers are to be found on the technical data sheets that are manuals for the products.

Furthermore, all applicators have to receive proper instruction before approval as applicators. This instruction includes inspection and approval of floors prior to treatment as well as correct application.

Moreover, sales agencies need to describe and evaluate any project using the products in order to ensure that the actual use of the floor is in consistence with the prescribed use of the products.

6. Record keeping and verification

BECOTREAT keeps the following records:

- Description of all projects where the products have been used - i.e.: Date of treatment, name of applicator, foreseen use of the floor, name of customer.
- Non-compliances related to the existing floor, the application, customer complaints and failures related to foreseen or unforeseen use.

All non-compliances are analysed and corrective actions are defined when necessary. Corrective actions could be:

- Further testing with new agents
- Further testing under new conditions
- Further education/instruction of applicators
- Change of instruction for application or use of the floors

7. HACCP Summary/HACCP Plan

Process Step	Hazard Description	CCP Description	Critical Limit	Monitoring Procedures/ Frequency/ Person Responsible	Corrective Action/ Person Responsible	HACCP Records	Verification Procedures
1. Preparing the existing floor for treatment with the product	P, B and C. The existing floor has to be concrete suitable for industrial floors	GMP	If the floor is not suitable, the floor cannot be treated	The applicator needs to get documentation from the customer related to the floor materials used. Surfaces must be clean, dry and absorbent. Confirm surface absorbency with a light water spray - surfaces designated for treatment should wet uniformly. Remove fat, oil and curing agents before use. The applicator is responsible for this.	If the floor is treated despite poor surface absorbency, the end result is not acceptable. Thus, usually it would be found when inspecting the end-result before closing the case. In that case a non-conformity message is sent to BECOTREAT Head office. The Head office takes care of the further dialogue with the customer.	Non-conformity messages and documents	The Head office closes the case with the customer. Verification relates to the removal of the product.

Process Step	Hazard Description	CCP Description	Critical Limit	Monitoring Procedures/ Frequency/ Person Responsible	Corrective Action/ Person Responsible	HACCP Records	Verification Procedures
2. Application of the product	P, B and C. The product to be distributed and saturated evenly and at a minimum temperature of 5°C	GMP	Min 5°C. To be distributed evenly Min 15 minutes wet surface.	The applicator is responsible for this.	In case of non-compliances, the applicator has to re-apply the product and file a message of non-conformity. BECOTREAT Head office has to be notified and a special inspection of the floor has to be conducted in order to evaluate if the floor is approved.	Non-conformity messages and documents	Report from the special inspection and approval of the floor
3. Drying and hardening	B, C and P. Correct temperature and time is needed in order to ensure drying and hardening	GMP	Min. 5°C. Min. 30-60 minutes of drying	The applicator is responsible for this.	In case of non-compliances, the applicator has to file a message of non-conformity. BECOTREAT Head office has to be notified and a special plan for treatment of the floor has to be designed. Furthermore, a special inspection of the floor has to be conducted in order to evaluate if the floor is approved.	Non-conformity messages and documents as well as the special treatment plan.	The special plan for the treatment of the floor. Report from the special inspection and approval of the floor
4. Design of application in order to avoid joints and seaming	B, C and P. The product to be distributed and saturated evenly and at a minimum temperature of 5°C	GMP	Min 5°C. To be distributed evenly Min 15 minutes wet surface. Min. 30-60 minutes of drying	The applicator is responsible for this	In case of non-compliances, the applicator has to file a message of non-conformity. BECOTREAT Head office has to be notified and a special plan for treatment of the floor has to be designed. Furthermore, a special inspection of the floor has to be conducted in order to evaluate if the floor is approved.	Non-conformity messages and documents as well as the special treatment plan.	The special plan for the treatment of the floor. Report from the special inspection and approval of the floor
5. Use of the floor - industrial traffic	P - followed by C and B. If the floor is not maintained, it will - sooner or later start to erode	GMP	No cracks or holes	The customer needs to ensure regular inspection of the floor	Maintenance and repair. In case of very rapid deformation, a complaint has to be sent to BECOTREAT Head office	Customer: Inspection records BECOTREAT: Customer complaints	Customer: Maintenance records BECOTREAT: Non-conformity records

Process Step	Hazard Description	CCP Description	Critical Limit	Monitoring Procedures/ Frequency/ Person Responsible	Corrective Action/ Person Responsible	HACCP Records	Verification Procedures
6. Use of the floor spillage of food and raw materials	P - followed by C and B. If the spillage is allowed to stay on the floor for a prolonged time, the lifetime of the floor will diminish	GMP	None defined as such. But generally, spillage has to be removed as quickly as possible	Customer procedures regarding spillage	Customer non-compliance handling	Customer non-compliance records	If for some reason a spillage seems to have damaged the floor, the customer is going to send a complaint to BECOTREAT Head office. BECOTREAT is going to verify if the spillage has damaged the floor-and why. BECOTREAT is going to define a special corrective action plan for the case.
7. Cleaning of the floor - exposure to cleaning agents	P followed by B and C. If the cleaning and disinfectant agents are allowed to stay on the floor for a prolonged time, the lifetime of the floor will diminish	GMP	None defined as such. But generally, cleaning agents and disinfectants to be removed from the floors as prescribed by the user instructions of the products	Customer procedures regarding cleaning and disinfection	Customer non-compliance handling	Customer non-compliance records	If for some reason a cleaning agent or a disinfectant seems to have damaged the floor, the customer is going to send a complaint to BECOTREAT Head office. BECOTREAT is going to verify if the product has damaged the floor-and why. BECOTREAT is going to define a special corrective action plan for the case.
8. General maintenance	P - followed by C and B. If the floor is not maintained, it will - sooner or later start to erode	GMP	No cracks or holes	The customer needs to ensure regular inspection of the floor	Maintenance and repair. In case of very rapid deformation, a complaint has to be sent to the BECOTREAT Head office	Customer: Inspection records BECOTREAT: Customer complaints	Customer: Maintenance records BECOTREAT: Non-conformity records



8. List of literature

1. European Commission: GUIDANCE DOCUMENT Implementation of procedures based on the HACCP principles, and facilitation of the implementation of the HACCP principles in certain food businesses. (Bruxelles 2005)
2. European Commission: Guidance document on the implementation of certain provisions of Regulation (EC) No 852/2004 On the hygiene of foodstuffs. (Bruxelles 2012)
3. The World Union of Wholesale Markets, European Regional Section: Community guide to good hygienic practices specific to the wholesale market management in the European Union. (WUWM November 2009)
4. Codex Alimentarius: PRINCIPLES AND GUIDELINES FOR THE CONDUCT OF MICROBIOLOGICAL RISK MANAGEMENT (MRM) CAC/GL 63-2007
5. Codex Alimentarius: GUIDELINES FOR RISK ANALYSIS OF FOODBORNE ANTIMICROBIAL RESISTANCE CAC/GL 77- 2011
6. Codex Alimentarius: GENERAL PRINCIPLES OF FOOD HYGIENE CAC/RCP 1-1969
7. Codex Alimentarius: CODE OF PRACTICE CONCERNING SOURCE DIRECTED MEASURES TO REDUCE CONTAMINATION OF FOOD WITH CHEMICALS CAC/RCP 49-2001
8. Codex Alimentarius: GENERAL STANDARD FOR CONTAMINANTS AND TOXINS IN FOOD AND FEED (CODEX STAN 193-1995)
9. The European Hygienic Engineering and Design Group (EHEDG): guideline for European Hygienic Engineering and Design Group (EHEDG document no. 8, April 2004
10. FAO Food and Nutrition Paper no. 87: Food Safety Risk Analysis.
11. Food Safety Inspection Service, United States Department of Agriculture October 13, 1999: Sanitation Performance Standards Compliance Guide

9. Declarations of performance for the products as construction products



Declaration of performance **CE**

Declaration no: BEC-0316

1. **Product Name:** BECOSAN Densifier

2. **Product type:** Water-based hardener and dust proofer for concrete floors.

3. **Intended use:** The solution penetrates and reacts with free lime within the concrete surface. The chemical reaction produces a denser concrete surface, which reduces abrasion wear and dust formation, it is water repellent and protects against oils, grease and chemicals. To be sold only for professional use.

4. **Name and contact address of manufacturer:**

BECO TREAT ApS
Nebelvej 15
8700 Horsens
Denmark
www.becotreat.com

5. **Authorized representative – If relevant:**
N/A

6. **AVPC**
System 2+
EN 1504-2:2005
EN 1504-9:2010
EN 1504-10:2006

7. **Notifying body – If relevant:**
N/A

The manufacturer has implemented a Factory Production Control System based on ISO 9001/2008. Certificate no: DIC577QMS

8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Abrasion resistance	< 3000 mg > m30% EN 13892-3	EN 1504-2:2005
Dangerous Substances	None – according to the Material safety Sheet and the list of ingredients, the product does not contain any chemical substances to be classified according to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Furthermore, the product does not contain any substances or very high concern as defined in the above mentioned regulation or substances classified as hazardous to the environment or any VOC's.	EN 1504-2:2005
Capillary absorption and permeability to water	w < 0,1 kg (m ² x 0,5 h) EN 1062-3	EN 1504-2:2005
Pull-off	> 2,0 N/mm ²	EN 1504-2:2005
Impact resistance	No damage, no cracks and delamination after loading, Class III EN ISO 6272-1	EN 1504-2:2005
Depth of penetration	> 5 mm.	EN 1504-2:2005
Fire Classification	A1	

The performance of the product hereby identified is on conformity with the declared performance. This declaration of performance is issued under the sole responsibility of the manufacturer.

Please note that a HACCP-evaluation has been performed in order to analyse and approve the use of the system and the floor treatment system as such in the food processing industries.

Place & Date: Horsens, 1 March 2016

Signature:



Kenneth Olsen
Managing Director

Declaration of performance 

Declaration no: BEC-0216

1. **Product Name:** BECOSAN Densifier Flash

2. **Product type:** Water-based hardener and dust proofer for concrete floors.

3. **Intended use:** The solution penetrates and reacts with free lime within the concrete surface. The chemical reaction produces a denser concrete surface, which reduces abrasion wear and dust formation, it is water repellent and protects against oils, grease and chemicals. To be sold only for professional use.

4. **Name and contact address of manufacturer:**

BECO TREAT ApS
Nebelvej 15
8700 Horsens
Denmark
www.becotreat.com

5. **Authorized representative – If relevant:**

N/A

6. **AVPC**

System 2+
EN 1504-2 2005
EN 1504-9 2010
EN 1504-10 2006

7. **Notifying body – If relevant:**

N/A

The manufacturer has implemented a Factory Production Control System based on ISO 9001/2008. Certificate no: DIC577QMS.

8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Abrasion resistance	< 3000 mg > m30% EN 13892-3	EN 1504-2 2005
Dangerous Substances	None – according to the Material safety Sheet and the list of ingredients, the product does not contain any chemical substances to be classified according to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Furthermore, the product does not contain any substances or very high concern as defined in the above mentioned regulation or substances classified as hazardous to the environment or any VOC's.	EN 1504-2 2005
Capillary absorption and permeability to water	w < 0,1 kg (m2 x 0,5 h) EN 1062-3	EN 1504-2 2005
Pull-off	> 2,0 N/mm2	EN 1504-2 2005
Impact resistance	No damage, no cracks and delamination after loading, Class III EN ISO 6272-1	EN 1504-2 2005
Depth of penetration	> 5 mm.	EN 1504-2 2005
Fire Classification	A1	

The performance of the product hereby identified is on conformity with the declared performance. This declaration of performance is issued under the sole responsibility of the manufacturer.

Please note that a HACCP-evaluation has been performed in order to analyse and approve the use of the system and the floor treatment system as such in the food processing industries.

Place & Date: Horsens, 1 March 2016

Signature:



Kenneth Olsen
Managing Director

Declaration of performance 



Declaration no: BEC-0116

1. **Product Name:** BECOSAN Combi

2. **Product type:** Water-based densifier and protective sealer for concrete floors.

3. **Intended use:** The solution penetrates and reacts with free lime within the concrete surface. The chemical reaction produces a denser concrete surface, which reduces abrasion wear and dust formation, it is water repellent and protects against oils, grease and chemicals. To be sold only for professional use.

4. **Name and contact address of manufacturer:**

BECO TREAT ApS
Nebelvej 15
8700 Horsens
Denmark
www.becotreat.com

5. **Authorized representative – if relevant:**

N/A

6. **AVPC**

System 2+
EN 1504-2 2005
EN 1504-9 2010
EN 1504-10 2006

7. **Notifying body – if relevant:**

N/A

The manufacturer has implemented a Factory Production Control System based on ISO 9001/2008. Certificate no: DIC577QMS

8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Abrasion resistance	< 3000 mg > m30% EN 13892-3	EN 1504-2 2005
Dangerous Substances	None – according to the Material safety Sheet and the list of ingredients, the product does not contain any chemical substances to be classified according to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Furthermore, the product does not contain any substances or very high concern as defined in the above mentioned regulation or substances classified as hazardous to the environment or any VOC's.	EN 1504-2 2005
Capillary absorption and permeability to water	w < 0,1 kg (m2 x 0,5 h) EN 1062-3	EN 1504-2 2005
Pull-off	> 2,0 N/mm2	EN 1504-2 2005
Impact resistance	No damage, no cracks and delamination after loading, Class III EN ISO 6272-1	EN 1504-2 2005
Depth of penetration	> 5 mm.	EN 1504-2 2005
Fire Classification	A1	EN 1504-2 2005

The performance of the product hereby identified is on conformity with the declared performance. This declaration of performance is issued under the sole responsibility of the manufacturer.

Please note that a HACCP-evaluation has been performed in order to analyse and approve the use of the system and the floor treatment system as such in the food processing industries.

Place & Date: Horsens, 1 March 2016

Signature:

Kenneth Olsen
Managing Director

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Declaration of performance 

Declaration no: BEC-0416

1. **Product Name:** BECOSAN Protective Sealer

2. **Product type:** Water-based treatment designed to protect all porous materials against water and oil penetration. Water and oil repellent for protecting porous building materials against grease stains and water based stains.

3. **Intended use:** For use on All mineral surfaces like natural stones, concrete floors and slabs, clay tiles, terracotta floorings, slate etc. consists of ultra thin molecules that penetrate deep into mineral substrates and create a hydrophobic and oleo-phobic surface, while it remains permeable to water vapour. To be sold solely for professional use.

4. **Name and contact address of manufacturer:**

BECO TREAT ApS
Nebelvej 15
8700 Horsens
Denmark
www.becotreat.com

5. **Authorized representative – If relevant:**

N/A

6. **AVPC**

System 2+
EN 1504-2 2005
EN 1504-9 2010
EN 1504-10 2006

7. **Notifying body – If relevant:**

N/A

The manufacturer has implemented a Factory Production Control System based on ISO 9001/2008. Certificate no: DIC577QMS.

8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Abrasion resistance	< 3000 mg > m30% EN 13892-3	EN 1504-2 2005
Dangerous Substances	None – according to the Material safety Sheet and the list of ingredients, the product does not contain any chemical substances to be classified according to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Furthermore, the product does not contain any substances or very high concern as defined in the above mentioned regulation or substances classified as hazardous to the environment or any VOC's.	EN 1504-2 2005
Capillary absorption and permeability to water	w < 0,1 kg (m2 x 0,5 h) EN 1062-3	EN 1504-2 2005
Pull-off	> 2,0 N/mm2	EN 1504-2 2005
Impact resistance	No damage, no cracks and delamination after loading, Class III EN ISO 6272-1	EN 1504-2 2005
Depth of penetration	> 5 mm.	EN 1504-2 2005
Fire Classification	A1	

The performance of the product hereby identified is on conformity with the declared performance. This declaration of performance is issued under the sole responsibility of the manufacturer.

Please note that a HACCP-evaluation has been performed in order to analyse and approve the use of the system and the floor treatment system as such in the food processing industries.

Place & Date: Horsens, 1 March 2016

Signature:



Kenneth Olsen
Managing Director