developing surface technology

technical document

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developing surface technology

Chem-Crete Pavix CCC100®

permanent protection for concrete and stone

Process Overview

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Chem-Crete Pavix CCC100® keypoints

Unique, environmentally friendly protection treatment
Full protection in a single application
Permanent protection
Non-toxic – ideal for use near and over water
Improves protection against freeze/thaw
Completely safe for operative and site use
Prevents buddleia growth
Protects and maintains historic monuments and buildings

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Description

Chem-Crete Pavix CCC100® is a crystallising moisture blocking hydrophobic impregnation material. It operates by a hydrophilic action in which it seeks moisture and hygroscopically combines with it to form strong, permanent, tightly bonded, insoluble crystals within the pores and capillaries of concrete surfaces.

Chem-Crete Pavix CCC100® cures to form a permanent water repellent but vapour permeable layer that inhibits the ingress of water and/or chloride and sulphate ions.

Chem-Crete Pavix CCC100® is the only product currently available that delivers combined moisture blocking and repelling mechanisms. The very low viscosity of Chem-Crete Pavix CCC100® ensures its penetration into the concrete surface where it forms its protective crystals.

Chem-Crete Pavix CCC100® is a unique water-based chemical product that gives permanent treatment and ultimate protection of large-scale concrete surfaces against moisture associated problems.

Chem-Crete Pavix CCC100® gives excellent protection against the effects of cracking damage caused by repeated freeze/thaw cycles, chloride ions penetration and alkali reactions.

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Function

Chem-Crete Pavix CCC100® must be absorbed by the substrate for optimal impregnation. For this reason the surface must be dry at the time of application. Where surfaces are dusty, blowing down with compressed air or brushing with a broom is recommended as a means of unblocking surface pores and removing surface dust. The impregnant is applied undiluted in a one single coat operation to the substrate using the most efficient and appropriate of the above equipment. If it should rain during application of the impregnant, work should stop immediately. However, there is no need to take any action to cover surfaces that have already been treated with Chem-Crete Pavix CCC100®. Impregnation work can resume once the surface is completely dry.

The impregnant must not be applied at temperatures lower than 5°C or above 40°C. Chem-Crete Pavix CCC100® can be applied to new concrete substrates after 7 days. If allowed to cure, Chem-Crete Pavix CCC100® may form a thin layer of crystals on over-sprayed non-cementitious surfaces. Chem-Crete Pavix CCC100® will have no adverse effect on bituminous materials or protective coatings. Where aluminium, galvanized steel or non-cementitious material are likely to be affected by over-spray, these should be protectively covered or washed down immediately with clean water on becoming contaminated. Due to the non-toxic and water-based nature of Chem-Crete Pavix CCC100® special measures are not necessary in respect to disposal of the wash water.

Part used containers of Chem-Crete Pavix CCC100® are to be kept tightly closed at all times during use and when not in use. Chem-Crete Pavix CCC100® oxidises aluminium and galvanized steel thus it should not be stored in containers made of such.

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Advantages

Chem-Crete Pavix CCC100® will prevent penetration of chlorides ions from de-icing salts. It will protect against damage caused by repeated freezing/thawing cycles and provide a permanent internal waterproofing and moisture blocking function from both positive and negative sources.

Chem-Crete Pavix CCC100® has excellent repelling properties against water, jet fuel and oil. It will resist aggressive chemical attack from acids, caustics jet fuels and oil.

Chem-Crete Pavix CCC100® is resistant to jet fuel, oil, acid and de-icing salts.

Chem-Crete Pavix CCC100® will protect the reinforcing steel bars against corrosion without any negative effect on any existing steel cathodic protection.

Chem-Crete Pavix CCC100® will reduce Alkali Silica Reactions (ASR) thus eliminating Silica dusting and increase concrete hardness.

Chem-Crete Pavix CCC100® will not adversely affect adhesion for subsequently applied surface coating systems.

Chem-Crete Pavix CCC100® seals and protects hairline and thermal cracks up to a width of 1.4mm.

Chem-Crete Pavix CCC100® is water-based, non-toxic and totally environmentally safe. It is also completely safe for use over rivers and clean water.

A single application treatment will ensure a permanent waterproofing of all cementitious surfaces.

Chem-Crete Pavix CCC100® cures with a thick crystal structure and is thus more durable against wind driven and other erosion sources than traditionally used impregnates.

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Uses

Chem-Crete Pavix CCC100® can be used as a treatment and protection against all water and moisture associated problems for all concrete and cementitious surfaces. It is effective for new and refurbished concrete structures alike.

It is a highly cost effective treatment for treating;- airport runways, aircraft hard standings, taxiways, bridges and highway structures multi storey car park decks and structures. In fact, all concrete can be effectively treated with Chem-Crete Pavix CCC100®.

How to Use

Concrete surfaces must be clean, dry and sound prior to applying Chem-Crete Pavix CCC100®.

The use of compressed air or brushing is recommended to remove all loose particles and dust from the surface.

If the surface to be treated is heavily contaminated it is recommended that cleaning be carried out by using high pressure steam cleaning. The use of special concrete cleaning agents may be necessary for areas contaminated with oil.

Chem-Crete Pavix CCC100® should be applied in one single coat only by means of spraying, sweeping or brushing. For large-scale applications it is recommended using the computerised Chem-Crete Pavix CCC100® application equipment.

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Application

Chem-Crete Pavix CCC100® is supplied on site in sealed containers. The product is applied evenly to the surface either by spray or brushing. The surface is to be completely covered with the impregnant at a dosage rate of approx 200ml/m^2. The surface must be completely saturated to ensure optimal take-up of Chem-Crete Pavix CCC100®.

Chem-Crete Pavix CCC100® must not be applied if the temperature falls below 5ºC or above 40ºC or if raining. It is recommended that all surfaces being treated must be completely dry at the time of application.

As with all impregnation materials and processes, surface must be free from any contaminate that might reduce uptake of the impregnate. A visual check for contamination will normally suffice. Where the history of the structure is unknown and the presence of surface contamination is in question, absorption can be confirmed by applying a pure water spray and observing its normal take up into the porous concrete surface. Water will tend to run off rather than be absorbed on adversely contaminated surfaces.

Whilst there are no accepted specific values, tests methods such as ISAT (BS 1881 Part 208: 1996) can be used to investigate and compare surface absorption characteristics.

Wearing and trafficked areas can be opened for use within 1 hour of application. Full detailed instructions are available in the process “Method Statement”.

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Materials Information

Water-based crystal forming moisture-repelling chemical.

Pavix CCC100 complies with the requirements of Highways Agency Design Manual for Roads and Bridges BD43/03, Volume 2 Highway Structure Design, Section 4 Paints and other Protective Coatings: The impregnation of reinforced and pre-stressed concrete highway structures using pore lining impregnants.

Test Report: ESRC/2003/CP/01 by Professor Denis A. Chamberlain

Test Institute: School of Engineering, City University, London, UK.

American Society for Testing & Materials (ASTM): C666, C672, C1218, C944, D4541

Pavix CCC100 is safe for workers and is environmentally friendly

Refer to Material Safety Data Sheet or contact ASI Solutions plc.

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Approved Equipment

A: For cleaning and preparation of concrete surfaces: Compressed air equipment and brushes for general preparation, super heated steam cleaning unit for contaminated surfaces or special chemical cleaning where necessary.

B: For application: The range of approved application equipment includes backpack spray unit, powered airless spray unit and the fully computerised application unit. Brushes, brooms, rollers and squeegees may also be used.

Application Rates

Chem-Crete Pavix CCC100® must be evenly applied onto the prepared surface at a rate of approx.200ml/m^2. Surface must be saturated.

Application Considerations

Chem-Crete Pavix CCC100® must be absorbed by the substrate for optimal impregnation. For this reason the surface must be completely dry prior to application. Where surfaces are dusty, blowing down with compressed air or brushing with brooms as a means of unblocking surface pores and removing surface dust. The impregnant is applied undiluted in a one single coat operation to the substrate using the most efficient and appropriate of the above equipment. If it should rain during application of the impregnant, work should stop immediately. However, there is no need to take any action to cover surfaces that have already been treated with Chem-Crete Pavix CCC100®. Impregnation work can resume once the surface is completely dry. The impregnant must not be applied at temperatures lower than 5ºC or above 40ºC.

Chem-Crete Pavix CCC100® can be applied to new concrete after 7 days. Due to the non-toxic and water-based nature of Chem-Crete Pavix CCC100®, special protective measures are not essential for asphalt, bearings, and furniture or nearby areas not being treated. If necessary, over-sprayed areas can be washed with clean water following the impregnation work. Part used containers of Chem-Crete Pavix CCC100® are to be kept tightly close at all times during use and when not in use.

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Character Data of the Product

Appearance:	Clear water-like
Odour:	None
Fumes:	None Specific
Gravity:	Approx 1.073
Viscosity:	2.4 Centipoises
Freezing Point:	-4°C
Boiling Point:	103°C PH
Value:	Approx 8.5
Toxicity:	None
Environmental Hazards:	None
Trafficable:	1 hour after application

Range of Use

Chem-Crete Pavix CCC100® is especially formulated for moisture blocking impregnation of reinforced concrete bridges, highways, aircraft pavements, buildings and marine structures is appropriate for both newly constructed and refurbished structures is suitable for all concrete substrates that are appropriate for treatment with hydrophobic agents such as Silane

Masonry and other porous building materials may similarly benefit from treatment with Chem-Crete Pavix CCC100®.

Approved Training

Chem-Crete Pavix CCC100® must only be applied by personnel holding a current ASI Solutions plc Pavix CCC100® "Authorised User Certificate". Details of training programme and certification are available from the product distributor. The Authorised User must complete an on-site Quality Control Sheet after every application of Chem-Crete Pavix CCC100®

Technical Services

A comprehensive range of advisory and on-site technical services is available through the product distributor.

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/ risk assessment

/ risk assessment

Hazard		Risk Evaluation
Road and site traffic		
Groups Exposed	All personnel either working on, or visiting site.	**LOW**
Control Procedures in Place:	Alternative routes for road and site traffic to be arranged prior to attendance on site. Site supervision staff have been trained and received certification under the Street Works Act. All site staff have been trained by site supervision staff. Traffic signals, road signs and cones are positioned as required by the Traffic Signs Manual. All staff wear high-visibility clothing at all times whilst on site. All on site vehicles display appropriate signs and beacons.	
Company vehicle		
Groups Exposed	All personnel either working on, or visiting site.	**LOW**
Control Procedures in Place:	Vehicles only used by properly licensed drivers. All vehicles maintained in accordance with manufacturer's schedules.	
Surface cleaning		
Groups Exposed	All personnel working on, or visiting site, road users and pedestrians.	**LOW**
Control Procedures in Place:	Equipment used by trained personnel. Cleaning takes place in the direction away from operatives and vehicles. Cleaning will be temporarily suspended when pedestrians are in close proximity. Operatives wear masks, goggles and safety footwear.	
Materials for application		
Groups Exposed	All personnel working on, or visiting site, road users and pedestrians.	**LOW**
Control Procedures in Place:	Materials to be kept in sealed containers until required. Material to be transferred to spraying equipment by means of hand operated or powered pump.	

Date: 24.04.2006

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Hazard		Risk Evaluation
Use of spraying equipment		
Groups Exposed	All site staff.	**LOW**
Control Procedures in Place:	Equipment used by trained personnel only. Spraying takes place in the direction away from operatives and vehicles. Spraying will be temporarily suspended when pedestrians are in close proximity. Operatives wear chemical resistant gloves, goggles and safety footwear.	
Dust and dirt from cleaning process		
Groups Exposed	All site staff.	**LOW**
Control Procedures in Place:	Gloves and overalls & safety goggles provided.	
Working at heights		
Groups Exposed	All site staff.	**HIGH**
Control Procedures in Place:	Only certified or type trained operatives.	
Inclement weather		
Groups Exposed	All personnel working on, or visiting site, road users and pedestrians.	**LOW**
Control Procedures in Place:	Warm and waterproof coats. N.B. The normal site operations cannot be performed in wet weather or in temperatures lower than 0°C due to the substances used.	

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/ COSHH Assessment

To be read in conjunction with Material Health & Safety Data Sheet and the relevant Process Method Statement

/ COSHH Assessment No 1

Hazard	Risk	Action
Prolonged and intensive skin exposure	LOW	Use suitable chemical contact resistant safety gloves. Wash thoroughly with cold water
Inhalation	LOW	Use suitable safety mouth protection
Eye contact	LOW	Use suitable safety eye protection
Fire	NIL	Not applicable
Ingestion	LOW	If ingested do not induce vomiting. Drink solution of baking soda and water

Commentary:

The risks to health associated with the use of Chem-Crete Pavix CCC100® are low when being used in accordance with the product method statement.

When using Chem-Crete Pavix CCC100® all personnel are reminded of their obligation to adhere to the method statement.

The work site must be cordoned off from the public while application is taking place.

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/ material safety data sheet

01. Substance Identification / 02. Composition / 03. Hazard Identification / 04. First Aid Measures

/ material safety data sheet

N/E=Non Established N/A=Not Applicable N/D=No Data Available

01. Chemical Product and Company Identification

Material/Trade Name:	Chem-Crete Pavix CCC100®
Type:	Aqueous coating
Application:	Concrete Waterproofing Agent
Company:	ASI Solutions plc Unit 4 Station Road Industrial Estate Station Road Winslow Bucks MK18 3RQ
Telephone:	+44 (0)1296 715151
Fax:	+44 (0)1296 715155
Internet:	www.asiplc.com

02. Composition

Substance(s)		% Wt.	Cas No.	EEC No.
Propan-2-ol (Isopropyl Alcohol)	F;R11 Xi;R36-66-67	<0.5%	67-63-0	200-661-7

03. Hazard Identification

Not classified as hazardous under the CHIP Regulations 2002 as amended. Not classified as hazardous according to EC/2001/58, EEC/67/548

04. First Aid Measures

Inhalation:	In case of excessive inhalation, remove to fresh air and rest. If recovery is not rapid obtain prompt medical attention.
Eyes:	Irrigate with water. Take care not to wash chemical from one eye to another. If irritation persists consult a doctor.
Skin:	Remove contaminated clothing. Wash with water. If irritation persists, obtain medical attention.
Ingestion:	Do not induce vomiting. Give plenty of water to drink. Beware of aspiration if vomiting occurs. If feeling unwell seek medical attention immediately.

Date: 11.07.2006

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05. Fire-fighting Measures / 06. Accidental Release Measures / 07. Handling and Storage / 08. Exposure Controls

/ material safety data sheet

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05. Fire-fighting Measures	
Suitable Extinguishers:	Foam, Dry powder, Carbon Dioxide, Water spray Inert material – Sand, earth, etc.
Unsuitable Extinguishers:	None
Hazardous Decomposition:	If involved in a fire may decompose to produce toxic fumes
Special Procedures:	Do not breathe decomposition products and fumes Use approved self-contained breathing apparatus and fire retardant clothing Large fires should only be tackled by trained personnel
06. Accidental Release Measures	
Exposure Controls:	Do not allow spill to enter drains and watercourses Clean up as part of good housekeeping practice
Personal Protection:	Wear nitrile or PVC gloves and use eye protection such as goggles to BS EN 166 Chemical Grade if contact likely
Disposal Considerations:	Absorb in an industrial spillage absorbent Scoop up and place in container to await transfer Dispose of in accordance with local authority regulations
07. Handling and Storage	
Handling:	Avoid skin and eye contact Handle with care to avoid dust formation Ensure adequate ventilation Use local extraction equipment where possible Wear suitable protective clothing (see section 8)
Storage:	Store in a cool, dry, well ventilated area Store away from oxidising materials Do not allow product for freeze
08. Exposure Controls	
Occupational Exposure Limit:	999mg/m_3 8hrTWA 1250mg/m_3 15minSTEL WEL Propan-2-ol
	Wear impervious gloves (e.g. nitrile gloves) Wear suitable overalls or clothing and change if contaminated Wear suitable eye protection such as BS EN 166 splash likely Use in well ventilated areas Use mechanical ventilation if possible

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09. Physical and Chemical Properties / 10. Stability and Reactivity / 11. Toxicological Information / 12. Ecological Information / 13. Disposal Considerations

/ material safety data sheet

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09. Physical and Chemical Properties

Appearance:	Clear liquid
Odour:	None
pH:	N/E
Boiling point/range:	104°C
Melting point/range:	N/E
Flash point:	N/E (>61)°C
Flammability:	Non flammable
Autoflammability:	N/A
Explosive properties:	None
Oxidising properties:	None
Vapour pressure:	N/E
Relative density:	1.01
Solubility:	Miscible in water

10. Stability and Reactivity

Stable at normal temperatures. No hazardous decomposition products when stored and handled correctly

11. Toxicological Information

Routes of exposure: inhalation, skin absorption and ingestion. Acute effects from ingestion: Nausea, vomiting and stomach pain. Repeated skin contact may cause dermatitis or allergic reaction in sensitive individuals

12. Ecological Information

Ecotoxicity:	Not expected to be harmful to aquatic life
Persistence:	Readily biodegradable in the environment
Bioaccumulative potential:	Low
Mobility:	Mobile, volatile liquid miscible in water

13. Disposal Considerations

Waste from residues /unused products:	Can be landfilled in compliance with local regulations. Incineration should only be undertaken by a licensed contractor. Where possible, recycling should be preferred to disposal.
Packaging:	No specific requirements.

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14. Transport Information / 15. Regulatory Information / 16. Other Information

/ material safety data sheet

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14. Transport Information

Not classified as hazardous for transportation

15. Regulatory Information

a) Risk & Safety	Not classified as hazardous under the CHIP Regulations 2002 as amended Not classified as hazardous according to EC/2001/58, EEC/67/548
b) Other Regulations	Health & Safety At Work etc. Act 1974 Control of Substances Hazardous to Health Regulations 2004 as amended Environmental Protection Act 1990 EC Safety Data Sheet Directive EC/91/55

16. Other Information

The information in this Safety Data Sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, management and for people working with or handling these products. This information is believed to be reliable and updated at Revision Date, and represents the best information currently available and known by ASI Solutions PLC (ASI). However, ASI makes no guarantee or warranty, express or implied, with respect to such information and we assume no liability resulting from its use. The information related herein is based on proper handling and anticipated uses and is for the material without chemical additions or alterations. Users should make their own investigations to determine the suitability of the information for their particular purposes. It is the responsibility of the user to undertake a suitable risk assessment/COSHH assessment prior to using this material.

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