



**FLOWFRESH HARDENER B
FLOWFRESH CM HARDENER B
MATERIAL SAFETY DATA SHEET
Revision 2 – Date Revised: 04/30/2012**

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product Name Flowfresh Hardener B – Flowfresh CM Hardener B

Application Isocyanate component of a 4 pack polyurethane resin floor system.
Mixed product is applied by trowel.
Polyisocyanate based on diphenylmethane diisocyanate,.
This component does not contain any antimicrobial agent. It is in the Filler C.

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	EINECS No.	CAS No.	% by weight	Symbols and Risk Phrases
diphenylmethane-diisocyanate isomers and homologues	-	9016-87-9	> 95	Xn; R20; R36/37/38;R42/43

See section 16 Additional information, for full text regarding symbols and Risk phrases.

3. HAZARDS IDENTIFICATION

Harmful by inhalation. This hazard is most likely to arise when materials are heated, sprayed, used in a confined unventilated space or if correct handling procedures are not followed.

Irritating to eyes, respiratory system and skin. In mild cases the affected person may experience slight irritation of the eyes, nose and throat, possibly combined with dryness of the throat. In more severe cases the person may suffer acute bronchial irritation and difficulty in breathing.

May cause sensitization by inhalation and skin contact. Repeated and /or prolonged exposure may cause an allergic reaction/sensitization. Once sensitized, an individual may produce an allergic reaction every time they are in contact with isocyanates. Individuals who have developed sensitivity may experience wheezing, tightness of the chest and shortness of breath. A hyper-reactive response to even minimal concentrations of isocyanate may develop in sensitized persons.

When the base is mixed with the hardener an exothermic reaction starts (i.e. heat is generated).
If the mix is not applied within 20 - 30 minutes some smoking may occur.

4. FIRST- AID MEASURES

Inhalation Remove affected person from exposure, keep them warm and at rest. Obtain immediate medical attention. Delayed appearance of the complaints (difficulty in breathing, coughing, asthma) are possible following severe exposure.

Skin contact Wash with soap and plenty of water or a suitable skin cleanser as soon as possible.
If irritation persists, seek medical advice.

Eye Contact Hold eyelids apart and carefully and thoroughly flush with plenty of water for at least 15 minutes.
Seek medical advice.

Ingestion If the person is conscious, wash out mouth with water. Do not swallow mouth wash.
Do not induce vomiting unless under medical supervision. Seek immediate medical attention.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media Carbon dioxide (CO₂), foam, dry powder.
Water spray should be used for larger fires.

Un-Suitable extinguishing media High volume water jet.

Special exposure hazards Burning produces carbon oxides, hydrogen cyanide, nitrogen oxides and isocyanate vapor.

Special protective equipment Wear self-contained breathing apparatus and protective suit.

Additional information Reaction between water and hot isocyanate may be vigorous.
Do not allow contaminated extinguishing water to enter the soil, drains, sewers or water courses.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions Use personal protective equipment as detailed in Section 8.
Ensure adequate ventilation.

Environmental precautions If a major spillage (an area greater than 2 square meters), clear the area of non-essential personnel.
Prevent further leakage or spillage and prevent entry into drains, sewers and water courses. The reaction with water produces carbon dioxide and insoluble material which could cause the drains to block. If any enters drains, flush away with copious amounts of water.
It is an offence to discharge effluent down the drain without prior consent from the appropriate authority. Check where the drain chosen for disposal goes. If it goes to a watercourse, check that disposal of the spillage will comply with the Environmental Agency or SEPA consent. If it goes to the sewer, check the consent issued by the sewerage authority.
If washing the spillage to drain will breach a consent condition, dispose of in another way. Make sure the disposal site is licensed to accept this type of waste.

Methods for cleaning up Soak up with inert absorbent material (e.g. sand, sawdust) wetted out with water to expedite the process. Leave the material to react for 30 minutes.
Shovel into suitable open-top containers, do not close container for at least 24 hours (because of evolution of carbon dioxide) and keep damp in a safe, well ventilated area.
Dispose in accordance with Section 13.
Wash the area with plenty of water.

7. HANDLING AND STORAGE

Handling Ensure adequate ventilation or provide exhaust ventilation in work area.
If sprayed, exhaust ventilation is required and all other personnel to be excluded from area.
In all areas where isocyanate aerosols and/or vapor concentrations are produced, exhaust ventilation must be provided in such a way that the MEL (see section 8) is not exceeded. The air should be drawn away from the personnel handling the product.
Use personal protective equipment as detailed in Section 8.
Handle and open container with care. Avoid skin and eye contact.

Storage Store in a dry, cool, well-ventilated place. Keep container tightly closed.
Do not allow to freeze as some crystallization will occur.
Maintain store between temperatures 40 - 95 °F.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Workplace Exposure Limit (WEL) Isocyanates, all (expressed as –NCO)
0.02 mg/m³ 8 hour Time Weighted Average (TWA)
0.07 mg/m³ 15 minute Short Term Exposure Limit (STEL)

Engineering measures to reduce exposure Ensure adequate ventilation, especially in confined areas.
If sprayed, exhaust ventilation is required.

Personal protective equipment

Respiratory protection Required in insufficiently ventilated working areas (especially during mixing and always if sprayed). An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter respirator.
In the case of hypersensitivity of the respiratory tract (e.g. asthmatics and those who suffer from chronic bronchitis) it is inadvisable to work with the product.

Eye protection Goggles or full face mask.

Hand protection Impermeable gloves (nitrile butadiene rubber [NBR], Butyl rubber [IIR], Fluorinated rubber [FKM], polyvinyl chloride [PVC], polychloroprene [CR]).
Isocyanates can harden gloves and increase the risk of their splitting.
Check regularly for degradation and replace as necessary.

Skin and body protection Protective suit and heavy duty work shoes.

Protective measures Handle in accordance with good industrial hygiene and safety practice.
Wash hands before breaks and immediately after handling the product.
When using do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Brown liquid.	Viscosity	45 - 95 mPa's at 80 °F
Odor	Earthy, musty	Relative Density	1.24 at 70 °F
Boiling Point	> 550 °F, decomposes/polymerises	Water solubility	Insoluble, reacts to produce carbon dioxide and polyurea solid.
Flashpoint	> 350 °F	Ignition temperature	>1110 °F
Vapor pressure	<0.0001 mbar at 70 °F (100Pa = 1 mbar)	Vapor Density	8.5

10. STABILITY AND REACTIVITY

Material is stable when stored and handled correctly.

When the base is mixed with the hardener an exothermic reaction starts (i.e. heat is generated).

If the mix is not applied within 20 – 30 minutes some smoking may occur.

Conditions to avoid	Avoid high temperatures. Do not allow to freeze.
Materials to avoid	Exothermic reaction with amines, alcohols, bases and acids. Reacts with water forming carbon dioxide and polyurea solid.
Hazardous decomposition products	No hazardous decomposition products when stored and handled correctly. Thermal decomposition – polymerises at >300 °C with evolution of carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	LD ₅₀ Oral (rat) : >5,000 mg/kg
Inhalation	LC ₅₀ inhalation (rat) ca. 490 mg as aerosol/m ³ , 4 hrs exposure. Concentration of saturated vapor: 0.09 mg/m ³ at 80 °F
Irritation	Over exposure, especially when spraying without the necessary precautions, entails the risk of concentration dependant irritating effects on eyes, nose, throat and respiratory tract. In mild cases the affected person may experience slight irritation of the eyes, nose and throat, possibly combined with dryness of the throat. In more severe cases the person may suffer acute bronchial irritation and difficulty in breathing.
Skin	Prolonged contact with the skin may cause tanning and irritant effects. LD ₅₀ Dermal (rabbit) > 5,000 mg/kg
Sensitization	Repeated and /or prolonged exposure, especially at levels above the MEL, may cause an allergic reaction/respiratory sensitization. Once sensitized, an individual may produce an allergic reaction every time they are in contact with isocyanates. Individuals who have developed sensitivity may experience wheezing, tightness of the chest and shortness of breath. A hyper-reactive response to even minimal concentrations of isocyanate may develop in sensitized persons. The onset of respiratory symptoms (difficulty in breathing, coughing, asthma) may be delayed for several hours after exposure. Repeated and/or prolonged skin contact may cause skin sensitization. Animal studies have shown respiratory sensitization can be induced by skin contact with known respiratory sensitizers, including isocyanates. Animal studies have shown that respiratory sensitization can be induced by skin contact with known respiratory sensitizers including diisocyanates.
Long term toxicity	Animal testing has shown no long term adverse effects at or below the MEL. Chronic pulmonary irritation observed at high concentrations. There are reports that chronic exposure by inhalation may result in decreases in lung function.
Carcinogenicity	The classification for diphenylmethane diisocyanate has changed to carcinogenic, category 3, when it is in the form of respirable aerosol e.g. when sprayed.
Mutagenicity	There is no substantial evidence of mutagenic potential.
Reproductive toxicity	No birth defects seen in animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Observed ecotoxicity to fish, bacteria and invertebrates is low/very low and to worms and plants is very low. Brachydanio rerio LC ₀ : > 1000 mg/l 96 hour test Daphnia EC ₅₀ : > 1000 mg/l 48 hour test E Coli toxicity EC ₅₀ : > 100 mg/l 48 hour test
Mobility	Reacts with water to produce carbon dioxide and polyurea solid.
Persistence and degradability	The polyurea produced on contact with water is insoluble, inert and non-biodegradable. In air the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related isocyanates.
Bioaccumulative potential	Not expected to be bioaccumulative. In a pond study with gross contamination, there was no evidence of bioaccumulation.
Additional ecological information	It is unlikely that significant environmental exposure in the air or water will arise.

13. DISPOSAL CONSIDERATIONS

Unused Product/waste from cleaning etc.	Dispose of in accordance with local and national regulations. Do not empty into drains, sewers or water courses. EC Waste Catalogue (EWC) code: 08 05 01.
Contaminated packaging	Partially filled containers shall be disposed as for the product above. Fill well drained containers with water and a little detergent, allow to stand for at least 24 hours. Dispose of as non-hazardous packaging waste in accordance with local and national regulations after removing/invalidating the warning label. Use EWC Code 150112 Untreated well drained containers to be disposed of as hazardous packaging waste, use EWC Code 150110*.

14. TRANSPORT INFORMATION

Not classified as hazardous for transport.

Other information:

Not dangerous cargo. Irritating to skin and mucosa membranes. Avoid temperatures below 32 °F. Avoid heat above +120 °F. Keep dry. Keep away from foodstuffs, acids and alkalis.

15. REGULATORY INFORMATION

R-phrases

R20 Harmful by inhalation.
R36/37/38 Irritating to eyes, respiratory system and skin.
R42/43 May cause sensitization by inhalation and skin contact.

S-phrases

S23 Do not breathe vapor/spray.
S38 In case of insufficient ventilation, wear suitable respiratory equipment.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show this label where possible).
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S60 This material and/or its container must be disposed of as hazardous waste.

Special provisions statement Contains isocyanates. See information supplied by the manufacturer.

Hazardous component(s) which must be listed on the label Diphenyl methane diisocyanate, isomers and homologues

US EPA TSCA Status All chemical ingredients are listed on the TSCA inventory.
Canada Domestic All chemical ingredients are listed on the DSL

Substance List Status
EC Directives Dangerous Substances Directive, 67/548/EEC & adaptations.
Dangerous Preparations Directive, 1999/45/EC.
Safety Data Sheets Directive, 91/155/EEC and adaptations.

Statutory Instruments Chemicals (Hazard Information & Packaging for Supply) Regs 2002.
Control of Substances Hazardous to Health Regs 2002.
Environmental Protection (Duty of Care) Regs. 1991.

Codes of Practice Waste Management. The Duty of Care.
Approved classification and labeling guide (Fifth edition). L131.
The compilation of safety data sheets (Third edition).

Guidance Notes Occupational Exposure Limits EH40
CHIP for Everyone HSG(108)

16. OTHER INFORMATION

This data sheet does not replace the obligation of the user to provide their own assessment of workplace risk as required by other Health & Safety legislation.

HMIS Ratings

Health 2
Flammability 1
Reactivity 1

Applicators need to be trained in:-
Handling and hygiene associated with use of industrial chemicals.
Correct mixing and application of the product.
Correct cleaning and disposal methods.

Restrictions on Use

The product is intended for use by appropriately trained applicators in industrial situations. It is not suitable for use in home DIY applications, especially because of its hazardous nature and the protective measures required.

Notes

Do not use organic solvents for skin cleansing, it will lead to defatting of the skin, skin irritation and/or dermatitis.
Some solvents can be absorbed through the skin.
Beware of cross contamination where different products are in use in the same location.
Take into account the Manual Handling regulations when dealing with the mixed product.

This safety data sheet is based on our present knowledge and experience and is intended to serve as a guide for safe handling of the product regarding to health and environmental aspects.