

# Ronadeck Resin Bound Surfacing

Resin bound porous stone surfacing for pedestrian and vehicular trafficked surfaces

**Ronadeck Resin Bound Surfacing is a resin bound aggregate surface for pedestrian and vehicular trafficked surfaces. It is used to create pedestrian and drive-on surfaces which are decorative and functional, seamless and with slight flexibility.**

The open matrix allows water to drain through to the base, helps to reduce water ponding and allows water to naturally feed surrounding planted areas and trees. This open matrix construction is in line with the requirements of Sustainable Drainage Systems Regulations (SuDS) which are designed to reduce the potential of flooding on new and existing urban developments. An edging created from brick, stone, timber or steel should be installed to restrain the resin bound surfacing and create a clean tidy edge detail.

Areas laid with Ronadeck Resin Bound Surfacing can be complemented with the Ronadeck Tree Pit System using the same or contrasting colour/effect aggregates. Refer to separate data and information sheet.

Ronadeck Resin Bound Surfacing must be laid onto a sound stable and solid base such as concrete, asphalt or onto permeable bases for full SuDS compliance.

## Areas of use

- Footpaths, playgrounds, pool and pond surrounds
- Concourses and promenade decks
- Driveways and car parking bays
- Showrooms, shops, reception areas and galleries
- Patios, terraces, conservatories, gardens, gazebos, water features and roof gardens

## Features

- Natural aggregate appearance
- Attractive, complements surrounding area
- UV stable non yellowing resin
- Recycled aggregates available
- An alternative to conventional paving
- Highly permeable
- Anti-slip surface dressing increases safety

## Description

Ronadeck Resin Bound Surfacing comprises a two component polyurethane hybrid resin and a range of selected attractive aggregates. The design of this resin bound aggregate system provides a surface which is attractive, secure to receive foot traffic, and highly porous.

It's porosity reduces surface ponding of rain and water run-off from surrounding areas, allowing water to drain naturally, feeding plants, natural watercourses or manmade drainage systems. Problems associated with freeze / thaw cycle degradation are also reduced. This is in line with the requirements of Sustainable Drainage Systems Regulations (SuDS).

The resin is mixed with the aggregate and laid at the specified thickness. Brick, stone, timber or steel edging should be placed at the perimeter to restrain the material and provide a well defined decorative edge. A fine aggregate may be used to increase the slip resistance of the finished surface.

## Traffic

Ronadeck Resin Bound Surfacing is designed for foot traffic and occasional vehicle traffic such as on domestic driveways, residential developments with light domestic traffic or car parking bays. It is however, not a road surface for heavy volumes of domestic or commercial traffic. Heavier vehicle traffic, including heavy impact and high point loading will damage the surface and may result in failure.

## Scuffing

Due to the destructive scuffing forces created by power steering (e.g. three point turns) in car parks or on driveways where cars will repeatedly turn within a confined area, localised wear is more likely. It is therefore recommended that when the product is used in such locations, the surface is regularly inspected by the client or installer and maintained as required.

## Non yellowing UV resin

Ronadeck Resin Bound Surfacing Resin is UV resistant, it will not yellow on exposure to UV light. This is a more attractive option than other types of resin which can yellow and dramatically alter the appearance of the finished surface.



## Aggregate

The performance and appearance of the finished surface is dependent on the aggregate used. The Ronadeck Resin Bound Surfacing aggregate blends have been designed to achieve strength, resilience, porosity and decoration. They can be supplied pre-bagged by Ronacrete Ltd or can be blended on site by the contractor following the guide mixes issued by Ronacrete. It is important that aggregates independently sourced by the contractor are clean, kiln-dried, (typically with a moisture content no more than 0.5%), well graded and properly mixed in their correct proportions.

## Appearance

The appearance of samples and of materials supplied by Ronacrete are based on the colour, shade and grading of individual aggregates supplied to Ronacrete by its suppliers. Being largely natural aggregates, the appearance will vary from bag to bag and batch to batch, a uniform appearance should not be expected and cannot be achieved. Where appearance is important, darker aggregate blends are less likely to show wheel marks and accumulated debris.

## Maintenance

It is possible to repair localised damage by cutting out and replacing, ideally using the same aggregate as originally supplied. Ageing and weathering of the original may prevent an invisible repair. "Picking out" of some stones is possible but is likely to be minimal and localised. Any major loss of stone should be reported.

## Slip Resistance

Application of Ronadeck Resin Bound Surfacing Anti-Slip Aggregate will significantly increase the slip resistance of the surface in the wet, without substantial change to appearance and its use will help comply with Health and Safety obligations. See Table 2.

## Contractors

Ronadeck Resin Bound Surfacing is a specialist product and must only be applied by specialist applicators. Do not apply or allow it to be applied by contractors who do not possess the necessary skills and experience.

## Substrate Requirements

Only apply to a suitable substrate which is capable of supporting, restraining and bearing the weight of the traffic load. The best substrate is a well designed and constructed concrete, asphalt or tarmacadam. Application to any other surface is likely to result in early failure. If you are unsure of the substrate and its ability to receive Ronadeck Resin Bound Surfacing, do not proceed. Ronadeck Resin Bound Surfacing is a thin layer of 12mm minimum thickness or more, depending on the aggregate size. It may therefore mirror and reflect any surface unevenness. Substrates should therefore be levelled or smoothed prior to application to avoid this.

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### Construction of base

#### For pedestrian traffic

From base upwards, construction is typically 50-100mm of well compacted non-frost susceptible Type 1 sub-base to DoT Clause 803, followed by 40mm of 14mm close graded asphalt macadam surface wearing course to BS 4987 Part 2: 2001 Clause 7.3 which has been laid to a fall of not less than 1% to allow for good drainage and water run-off. The surface must be smooth and flat. Alternatively apply to sound well constructed and smooth concrete substrate. The base should be sound, clean and dry. New tarmac surfaces must be allowed to cool and gain strength for not less than 24 hours at 20°C. Ronacrete's Technical Department will be pleased to discuss permeable substrates.

#### For domestic driveways

From base upwards, construction is typically 100-200mm of well compacted non-frost susceptible Type 1 sub-base to DoT Clause 803, followed by 50mm of 14mm close graded surface course asphalt maximum 190 PEN to BS 4987 Part 1: 2001 or smooth brushed concrete finish (C30 min.) which has been laid to a fall of not less than 1% to allow for good drainage and water run-off. The surface must be smooth and flat. The base should be sound, clean and dry. New tarmac surfaces must be allowed to cool and gain strength for not less than 24 hours at 20°C. It is important to use aggregate designed for vehicle traffic. Ronacrete's Technical Department will be pleased to discuss permeable substrates.

#### For car parking bays

From base upwards, construction is typically 200-300mm of well compacted non-frost susceptible Type 1 sub-base to DoT Clause 803, followed by 65mm of 28mm dense asphalt base course maximum 190 PEN to BS 4987 Part 1: 2001 followed by 35mm of 14mm close graded surface course asphalt max 190 PEN BS4987 Part 1, 2001 or smooth brushed concrete finish (C30 min.) which has been laid to a fall of not less than 1% to allow for good drainage and water run-off. The surface must be smooth and flat. The base should be sound, clean and dry. New tarmac surfaces must be allowed to cool and gain strength for not less than 24 hours at 20°C. It is important to use aggregate designed for vehicle traffic. Ronacrete's Technical Department will be pleased to discuss permeable substrates.

#### For podium roof decks

From base upwards, construction is typically a suitably designed and constructed concrete deck, 20mm nipple mat drainage, a geotextile fabric, 120mm of well compacted Type 1 sub base to DoT Clause 803, 40mm of 20mm dense asphalt base course maximum 190 PEN to BS 4987 Part 1: 2001 followed by 20mm of well compacted 6mm medium graded surface course asphalt max 190 PEN BS4987 Part 1, 2001 or smooth brushed concrete finish (C30 min.) which has been laid to a fall of not less than 1% to allow for good drainage and water run-off. The surface must be smooth and flat. The base should be sound, clean and dry. New tarmac surfaces must be allowed to cool and gain strength for not less than 24 hours at 20°C. Ronacrete's Technical Department will be pleased to discuss permeable substrates.

### Installation Procedure

1. Only use clean, kiln-dried, well graded aggregates which are suitable for this use.
2. Ensure that the mixing station is fully waterproof when rain is expected, discontinue mixing when fog or mist are anticipated. Light rain on the surface of the system is unlikely to damage or affect the surface, see later reference to application in rainy conditions.
3. Only apply to a sound base.
4. Place Ronadeck Resin Bound Surfacing Decorative Aggregate into a clean, dry, forced action mixer, when using the 7.5kg resin unit, the mixer capacity must be no less than 110 litres.
5. Scrape all of the contents of Ronadeck Resin Bound Surfacing hardener component into the larger Ronadeck Resin Bound Surfacing resin container and mix with a drill and helical paddle mixer attachment for 30-45 seconds. Keep mixing time to a minimum to avoid a build up of heat.
6. Immediately add the mixed resin to the aggregate in the mixer. Mix the aggregate and resin together until all the aggregate is evenly coated with resin. Keep mixing time to a minimum to avoid a build up of heat.
7. Discharge the mixed resin and aggregate onto the prepared surface, level and smooth. Excessive compaction will reduce permeability.
8. Finish the surface with a suitable float.

9. If required, immediately cast Ronadeck Resin Bound Surfacing Anti-Slip Aggregate onto the top surface of the wet resin and aggregate, at the rate of approximately 0.1kg/m<sup>2</sup>. Ensure even coverage to prevent a patchy appearance.
10. Allow to cure. At 20°C protect against damage by heavy rain for 1 - 2 hours (see Rain during application) and open to traffic as described in Table 1.

	106.25kg mix
Ronadeck Resin Bound Surfacing Resin	7.5kg
Ronadeck Resin Bound Surfacing Resin Decorative Aggregate	106.25kg
Coverage (approx) *	5.84m <sup>2</sup> @ 12mm 4.675m <sup>2</sup> @ 15mm
Coverage (approx). Ronadeck Resin Bound Surfacing Anti-Slip Aggregate (cast into wet resin/ aggregate surface for increased slip resistance) *	0.1kg per m <sup>2</sup>

\* Coverage is based on application to a smooth flat surface and will vary when applied to undulating surfaces, according to compaction, and to the aggregate grading, which can change from batch to batch.

Minimum depths	12mm when using 3mm max. size aggregate 15mm when using 6mm max. size aggregate 25mm when using 10mm max. size aggregate
Foot traffic after Light vehicle traffic after	4 hours at 20°C 1- 2 days at 20°C

	Result / Potential for Slip*
Blend 1.17	115 Dry / Low Risk 126 Wet / Low Risk
Blend 9.32	118 Dry / Low Risk 127 Wet / Low Risk

\* Health and Safety Executive and UK Slip Resistance Group, 2000

Ronadeck Resin Bound Surfacing Resin	7.5kg
Ronadeck Resin Bound Surfacing Decorative Aggregate	106.25kg
Ronadeck Resin Bound Surfacing Fine Aggregate	5kg

# Ronadeck Resin Bound Surfacing

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## Shelf Life and Storage

Shelf life of Ronadeck Resin Bound Surfacing Resin is 6 months, aggregates have an unlimited shelf life. Store materials in clean, dry, frost free warehouse conditions between 5°C and 25°C. Protect from sunlight

## Health and Safety

Ronadeck Resin Bound Surfacing Resin contains small amounts of isocyanates and is harmful by ingestion and skin contact. It is not considered harmful for transportation. Protective clothing such as goggles, overalls and gloves is recommended to prevent any effect from prolonged skin contact, inhalation or ingestion. Refer to Health and Safety Data Sheet.

## Temperature

Ronadeck Resin Bound Surfacing Resin is rapid setting and rapid curing. It's pot life and working time is affected by temperature including material, air and substrate temperature. At temperatures above 25°C the pot life and working time may be insufficient to allow its proper application.

Work should therefore not proceed when product, air or substrate temperature exceed 25°C. The temperature of concrete and tarmacadam will generally be higher than the air temperature. The temperature of the substrate must therefore be measured and monitored during application and work should stop when temperature is above 25°C.

At low temperatures the resin will not flow sufficiently to achieve a smooth finish and work should not proceed when air, material or substrate temperature is below 5°C. Whilst it is possible to mix and apply at temperatures down to 0°C, the cure rate and rate of strength gain will be retarded; the surface must not be trafficked until it has gained sufficient strength.

## Rain during application

Light rain on the surface of the system is unlikely to cause damage to or affect the surface. Heavy rain is likely to spoil the appearance of the surface. Very heavy rain could wash out resin and aggregate. Therefore application during rain or when rain is anticipated during the cure period is not recommended. Care must be taken to keep the mixing station dry, thus avoiding entrapment of moisture between aggregate and resin.

## Site Attendance

When on site Ronacrete representatives are able, if asked, to give a general indication of the correct method of installing a Ronacrete product. It is important to bear in mind that Ronacrete Ltd is a manufacturer and not an application contractor and it is therefore the responsibility of the contractor and his employer to ensure he is aware of and implements the correct practices and procedures to ensure the correct installation of the product and that liability for its correct installation lies with the contractor and not with Ronacrete Ltd.

Blend	Max aggregate size mm	Minimum application thickness mm
Autumn Harvest (1.17)	5	15
Terracotta Gold (3.21)	5	15
Terracotta Snow (4.26)	5	15
Autumn Shingle (6.29)	3	12
Terracotta (7.30)	3	12
Harvest Crunch (9.32)	5	15
Rustic Bronze (10.33)	5	15
Silver Moon (11.34)	5	15
Sesame Gold (12.35)	5	15
Golden Glow (13.36)	5	15
Autumn Forest (14.37)	5	15
Golden Harvest (15.38)	5	15
Quartz Parallel (16.39)	6	15
All of these blends are suitable for foot and light domestic vehicle traffic.		
Aggregates <b>must</b> be dry (typically with a moisture content no more than 0.5%)		

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*Autumn Forest 14.37*



*Autumn Harvest 1.17*



*Autumn Shingle 6.29*



*Golden Glow 13.36*



*Golden Harvest 15.38*



*Harvest Crunch 9.32*



*Quartz Parallel 16.39*



*Sesame Gold 12.35*



*Silver Moon 11.34*



*Terracotta 7.30*



*Terracotta Gold 3.21*



*Terracotta Snow 4.26*

RONL560 Issue 19 22 June 2011

The information detailed in this leaflet is liable to modification from time to time in the light of experience and of normal product application, and before using, customers are advised to check with Ronacrete Ltd, quoting the reference number, that they possess the latest issue. Any person or company using the product without first making further enquiries as to the suitability of the product for the intended use does so at his own risk, and Ronacrete Ltd can accept no responsibility for the performance of the product, or for any loss or damage arising out of such use. All goods supplied subject to our Terms and Conditions of Sale see [www.ronacrete.co.uk](http://www.ronacrete.co.uk).



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**Ronadeck Resin Bound Surfacing**

## HEALTH AND SAFETY INFORMATION Ronadeck Resin Bound Surfacing Resin Part A

### 1. COMPOSITION

Chemical name	CAS	% by weight	Symbol	R-Phrases
Dibutyltin dilaurate	77-58-7	<5	Xn.n	36/38-48/22 50/53
2-(3-heptyl)-N-butyl-1, 3 oxazolane	165101-57-5	<5	N	51/53
Xylene		<5	Xn	10-20/2, 38
Branded polyalcohol With Esten and Ethergroup		<95		Non hazardous To health and environment according to EC

### 2. HAZARDS IDENTIFICATION

This health hazard assessment is based on a consideration of the composition of this product. Possible risk of irreversible effect and harmful by inhalation. It may cause irritation to skin and eyes.

### 3. FIRST AID MEASURES

Inhalation:	Remove patient from exposure. Rest, and obtain medical advice. DO NOT SMOKE.
Skin contact:	Remove contaminated clothing. Wash skin with water. If symptoms develop, obtain medical attention.
Eye contact:	Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel. This material may be difficult to remove from the eyes. Materials containing MDI may react with the moisture of the eye forming a thick material which may be difficult to wash from the eyes.
Ingestion:	The decision of whether to induce vomiting or not should be made by an attending physician.

### 4. FIRE FIGHTING MEASURES

Extinguishing media:	CO <sub>2</sub> chemical foam, powder. Water if no alternative.
Special exposure hazards:	Product may give off toxic fumes in a fire. Wear breathing apparatus. Excessive heat and contamination with water should be avoided.
Protective Equipment:	Breathing apparatus. Decomposition products could include Isocyanate and Hydrogen Cyanide.
Special Precautions:	Pressure build up with possible rupture of closed containers.

Increased vapour concentration of Isocyanate constituents.

#### 5. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Avoid contact with skin and eyes.
Environmental precautions:	Do not release to the environment. Prevent from spreading and entering drains and sewers. Absorb and neutralise by recommended procedure.
Methods for cleaning:	Absorb spillages in sand or any suitable absorbent material. Transfer to a controlled area and add approximately 5% of Decontaminant (supplied by Adhesives & Sealants Ltd). Allow to react and form a solid mass and dispose of in accordance with local regulations.

#### 6. HANDLING AND STORAGE

Handling:	Do not breathe fumes/vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If spraying use mask and gloves as advised in section 8. Persons with a history of skin sensitisation problems should not be employed in a situation where skin contact with this product could occur, nor should those with asthma or similar disorders be exposed to the vapour or spray mist. Good standards of industrial and personal hygiene should be observed.
Storage:	Store between 5°C and 25°C. Shelf life is 6 months. Keep away from frost. Containers should always be kept upright and tightly sealed to avoid leaking. Open only when ready for use and reseal part used containers after use. Store in a well labelled container preferably the original container. Keep containers cool, tightly closed and away from sources of ignition.

#### 7. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure controls:	Tin compounds (organic) 8 hour TWA OES 0.1mg/m <sup>3</sup> 10 min TWA OES 0.2mg/m <sup>3</sup> Organic tin compound can be absorbed through the skin.
Ingredient:	Xylene 441mg/m <sup>3</sup> 2-(3-heptyl)-N-Butyl-1,3 oxazolane, 8 hour ppm, TWA mg/m <sup>3</sup> , 15 min ppm, STEL mg/m <sup>3</sup> Biological monitoring guidance values.
Personal Protection:	Avoid contact with skin and eyes. Do not breathe vapour. Use only in well-ventilated areas.
Respiratory Protection:	Normal conditions of ventilation are usually adequate. Wear a fine particle mask or use local exhaust ventilation as necessary when using in confined areas with inadequate ventilation or whenever there is any risk of the exposure limits being exceeded. This applies not only to the user, but to all people who cannot be vacated from the work area.
Hand Protection:	Use protective gloves. Suitable types are PVC, neoprene or nitrile. Other types may be available and used, avoid those which soak up the product and lead to skin contact. If in doubt seek advice from a reputable manufacturer. Barrier creams may help to protect exposed areas but are not substitutes for full physical protection. They should not be applied once exposure has occurred. Gloves may degrade or be damaged according to different circumstances of use. Always ensure the gloves you are using are in good

condition.

Eye Protection: Eye protection designed to protect against liquid splashes should be worn, e.g. complete enclosure of the eyes to conform to EN 166 Chemical Grade.

Skin Protection: Cotton or cotton/synthetic overall or coveralls are normally suitable. Grossly contaminated clothing should be removed and the skin washed with soap and water to proprietary skin cleaner.

**8. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance: Yellowish  
Odour: Oily  
Boiling point: 127°C  
Flash point: Flash point 25°C  
Solubility: Immiscible with water but possible reaction with liberation of CO<sub>2</sub> gas.  
Viscosity at 23°C: Liquid  
Specify Gravity: 1.01g/cm<sup>3</sup>

**9. STABILITY AND REACTIVITY**

Stability: Stable in closed containers at normal temperatures and pressures.  
Conditions to avoid: Excessive heat  
Materials to avoid: Water  
Hazardous decomposition: Products formed in the event of fire include hydrochloric acid, isocyanates, products: traces of phosgene and hydrogen cyanide.

**10. TOXICOLOGICAL INFORMATION**

Inhalation: Solvent: Dizziness, nausea, and eventual loss of consciousness  
Isocyanate: Irritation sensitisation with asthmatic symptoms  
Ingestion: Rapid evaporation of solvent with aspiration into lungs. Irritation and possible solidification due to reaction with moisture.  
Skin contact: Defatting. Irritation and possible dermatitis.  
Eye contact: Irritation and possible serious damage.  
Long term effects: No information available.

**11. ECOLOGICAL INFORMATION**

Ecotoxicity: Do not release to the environment without neutralizing. This material is not hazardous.

**12. DISPOSAL CONSIDERATIONS**

Dispose in accordance with local and state regulations.

**13. TRANSPORT INFORMATION**

Haz Class: Xn Harmful  
UN. No: 2810  
ADR / RID Class: 6.1 ADR It 25c  
IATA Class: N/A

Packing Group: III  
IMO Class:  
IMDG Code: 6.1  
"Marine Pollutant":  
"Proper Shipping Name": Diphenylmethane – 4,4'-Diisocyanate Solution  
Additional information

#### 14. REGULATORY INFORMATION

Classification: R10; Xn; R20/21 Xi; R36/37/38 Xn; R42/43  
Risk Phrases: R10: Flammable  
R20/21: Harmful by inhalation and in contact with skin.  
R36/37/38: Irritating to eyes, respiratory system and skin  
R42/43: May cause sensitisation by inhalation and skin contact.  
Safety phrases: P4: Contains isocyanates. See information supplied by the manufacturer.  
S23: Do not breathe vapour.  
S24/25: Avoid contact with skin and eyes.  
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S36/37: Wear protective clothing and gloves  
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 label where possible).  
S60: This material and its container must be disposed of as hazardous waste.

Non-EEC Countries:

#### 15. OTHER INFORMATION

This Material Safety Data Sheet conforms to EC Directives 91/155/EEC and 93/112/EC. The information given here is to the best of our knowledge true and accurate and is provided solely for making safety assessments. It is not a sales specification or an indication of suitability for a particular use.

**HEALTH AND SAFETY INFORMATION**  
**Ronadeck Resin Bound Surfacing Resin Part B**

**1. COMPOSITION**

Chemical name:	Hexamethylene diisocyanate oligomers (*)
Synonyms:	Aliphatic polyisocyanate. Hexamethylene diisocyanate homopolymer (*)
Further data:	EC N° :500-060-2 (*)
CAS number:	28182-81-2 (*)
Hazardous impurities:	Hexamethylene diisocyanate (CAS:822-06-0): - (EC N°: 212-485-8): < 0.2% - EC Classification: T – R 23-36/37/38-42/43 (*)

**2. HAZARDS IDENTIFICATION**

Adverse human health effects:	May cause eye irritation May cause sensitization by skin contact
Environmental effects:	Presents no particular risk to the environment, provided the disposal requirements and national or local regulations are complied with. (*)
Physical and chemical hazards:	
Fire or explosion:	Combustible liquid.
Further hazards:	
On contact with water:	Carbon dioxide is released. Hazardous reactions occur on contact with many common products. (Refer to the list of incompatible materials section 9: "Stability-Reactivity").
Classification/specific hazards:	According to EC criteria, this product is classified as – Sensitizing.

**3. FIRST AID MEASURES**

Inhalation:	Vapours or aerosols: Move the affected person away from the contaminated area. Make the affected person rest. If breathing difficulties persist, give oxygen (by authorised personnel). Place under medical observation.
Skin contact:	Remove contaminated clothing and footwear. Wash immediately with plenty of soap and water.
Eye contact:	Immediately rinse with water for a prolonged period whilst keeping the eyes wide open. Always refer to an eye

specialist, even if there are no immediate symptoms.

Ingestion: If the person is fully conscious, try to induce vomiting. Call a doctor who will decide whether a stomach wash-out is necessary.

**4. FIRE FIGHTING MEASURES**

Extinguishing media:  
Suitable: Foam  
Powder  
Carbon dioxide CO<sub>2</sub>

Not suitable: Water

Special hazards: Combustible. During combustion toxic vapours are released.

Specific fire fighting methods: Stay upwind. Evacuate the personnel away from the fumes  
In case of fire close by: Cool down the containers/equipment exposed to heat with a water spray. Ensure that there is No direct contact between the water and the product.

Protection of fire-fighters: Self-contained breathing apparatus.

**5. ACCIDENTAL RELEASE MEASURES**

Personal precautions: Avoid contact with skin and eyes. Do not breathe gas.

Personal protection equipment:  
- Appropriate gloves  
- Safety glasses  
- Suitable protective clothing

Environmental precautions: Contain the spilled material by bunding.

Methods for cleaning: Absorb the product onto porous material. Wash contaminated area with large amounts of water. Recover the cleaning water for subsequent disposal.  
For disposal of solid materials or residues refer to section 12: "Disposal considerations"

**6. HANDLING AND STORAGE**

Handling  
Technical measures: Closed system, ventilation.

Measures: Avoid contact with water or humidity.

Safe handling advice: Comply with instructions for use (refer to technical sheet)

Storage:  
Technical measures: The floor of the depot should be impermeable

Storage conditions: To guarantee the quality and properties of the product keep in a cool, well ventilated area. Keep the container tightly closed and dry and only in the original container.

Packaging: Product must only be kept in the original packaging

Packaging materials:  
Recommended: - Aluminium

- Steel

Not suitable: - Copper and its alloys  
- Tin

## 7. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures: Ensure good ventilation of the work station.  
Control parameters  
Occupational exposure limits:  
Limits (France): The recommended limits SHOULD NOT be exceeded at any point during exposure.  
VME: 0.075mg/m<sup>3</sup> (0.01ppm)  
VLE: 0.15mg/m<sup>3</sup> (0.02ppm)  
(for HDI).  
VLE: 1mg/m<sup>3</sup>.  
(for the HDI prepolymer).

Limits (USA/ACGHI) TLV (TWA): 0.034mg/m<sup>3</sup> (0.005ppm).  
(for HDI).

Personal protective equipment  
Respiratory protection: When using a spray gun wear self contained breathing apparatus.

Hand protection: Protective gloves made of rubber.

Eye protection: Safety glasses.

Skin and body protection: Protective clothing.

Collective emergency  
Equipment: - Safety shower.  
- Eye fountain

Hygiene measures: Always take a shower after work. Do not drink, eat or smoke in the workplace. Separate normal clothes from work clothes.

## 8. PHYSICAL AND CHEMICAL PROPERTIES

Appearance  
Physical state: - Liquid  
Form: - Clear  
Colour: - Colourless to pale yellow  
Odour: - None  
pH: - Not applicable (reacts with water)

Specific temperatures  
Boiling: - > 220°C at 1.33 hPa.

Flammability characteristics  
Flash Point: 166°C (closed cup, according to method ASTM D 93)  
Auto-ignition temperature: 460°C (spontaneous ignition temperature)  
Oxidizing properties: Non oxidizing material according to EC criteria.  
Specific gravity: 1160kg/m<sup>3</sup> at 25°C

Solubility  
In water: Reacts  
In organic solvents: Soluble in:  
- Ketones  
- Esters

- Chlorinated solvents
- Aromatic hydrocarbons

Octanol/water partition

Coefficient: Not applicable: reacts with water

Dynamic viscosity: Approx 2400 mPa.s at 25°C

## 9. STABILITY AND REACTIVITY

Stability: Store at room temperature

Hazardous reactions

Materials to avoid: Reacts violently on contact with water, alcohols, amines, bases, protic solvents, water and aqueous solutions. With a great release of CO<sub>2</sub> and hence a risk of a pressure build-up in confined areas. Forms an insoluble solid precipitate.

Hazardous decomposition: On thermal decomposition (pyrolysis) releases:  
Toxic gases  
(Carbon dioxide (CO<sub>2</sub>)).

## 10. TOXICOLOGICAL INFORMATION

Acute toxicity:

LD50 (Oral, Rat) : > 5000mg/kg  
(Unpublished reports) (\*)

Local effects:

At high concentrations, the vapours can be irritating to the respiratory system.  
Repeated or prolonged contact may cause slight irritation to the skin.  
May cause irritation to the eyes.

Sensitisation:

Cutaneous sensitizer for guinea-pigs, when tested using the Magnusson and Klingman method.  
No pulmonary sensitisation was observed in guinea-pigs after either intradermal injection or inhalation induction with HDI polyisocyanates.  
(unpublished reports)

## 11. ECOLOGICAL INFORMATION

Mobility: Expected behaviour of the product: Ultimate destination of the product: SOIL and SEDIMENT.

Biodegradability:

Ultimate aerobic

biodegradability: Not biodegradable (internal evaluation) (\*)

Bioaccumulation:

Bioconcentration factor: Not bioaccumulable. (internal evaluation) (\*)

Ecotoxicity:

Effects on the aquatic environment:

EC50 (Daphnia: Daphnia magna) / 24h : > 100% saturated aqueous solution. (unpublished internal reports)  
The product does not have any known adverse effects on the aquatic organisms tested. (\*)

## 12. DISPOSAL CONSIDERATIONS

Waste from residues:

Prohibition: Discharging waste into rivers and drains is forbidden.

Destruction/Disposal: Neutralize with a mixture of ammonia solution (190g/l), water and ethanol (5%, 50% and 45%).  
Incinerate at a licensed installation.

Contaminated packaging:  
Decontamination/cleaning: Allow it to drain thoroughly.

Destruction/disposal: Incinerate drums and bottles at licensed site.

Note: The users attention is drawn to the possible existence of local regulations regarding disposal.

### 13. TRANSPORT INFORMATION

International regulations:

Land:

- Rail/road (RID/ADR): Not restricted

Sea (IMO/IMDG): Not restricted

Air (ICAO-IATA): Not restricted

### 14. REGULATORY INFORMATION

Labelling:

EC regulations: Mandatory labelling (self-classification) of hazardous substances: Applicable.

Identification of hazardous product:

Ronadeck Tree Pit Resin UV Part B  
Hexamethylene diisocyanate oligomers  
EC No. : 500-060-2. (\*)

Classifications/symbols: IRRITANT (Xi)

R phrases:

R 43: May cause sensitization by skin contact.

S phrases:

S 7/8: Keep container tightly closed and dry.

S 24: Avoid contact with skin.

S 37: Wear suitable gloves.

Further regulations:

France: > Maladies professionnelles: concerné  
Tableau n° 62

Note: The regulatory information given above only indicates the principle regulations specifically applicable to the product described in the Safety Data Sheet. The users attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

### 15. OTHER INFORMATION

Uses: This product is used mainly as a hardener in coating materials or adhesives. The handling of coating materials or adhesives containing reactive polyisocyanates and residual monomeric HDI requires appropriate protective measures referred to in this safety data sheet. These products may therefore be used only in industrial or trade applications. They are not suitable for use in homemaker (DIY) applications (\*)

Chemical formula: (C8 H12 N2 O0)x

R phrases of § 2 & 3: R 23: Toxic by inhalation  
R 36/37/38: Irritating to eyes, respiratory system and skin.  
R 42/43: May cause sensitisation by inhalation and skin contact. (\*)

\* Update: This sheet was updated on 10/07/07.  
Subheadings and text which have been modified since the previous version are indicated with an asterisk (\*).

Health and Safety at Work Act 1974.

HSE Occupational Exposure Criteria Document Summaries 1993 Edition (ISBN 0118821202).

Control of Substances Hazardous to Health (Regulations) 1988.

HSE Guidance Note EH26 (Occupational Skin Diseases - Health and Safety Precautions - HMSO 1981).

HSE Guidance Note EH40 (Occupational Exposure Limits).

Ronadeck Resin Bound Surfacing contains chemical additives in such small concentrations they are not considered hazardous to health.