

UCRETE®

UCRETE®

Protection for the Chemical Industry



 **BASF**

The Chemical Company

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UCRETE Industrial Flooring

UCRETE Industrial Flooring is specifically designed to meet the requirements of the chemical industry for process area flooring and to provide durable linings for secondary containment, bunds, sumps and drains.

UCRETE's heavy duty polyurethane resin binder produces a system that is moisture tolerant, suitable for external and internal applications with excellent resistance to a wide range of chemicals, heavy impact and thermal shock.

Our competence is based on 40 years of experience throughout the chemical industry. This expertise, acquired from many projects around the world, supports our continuous investment in the research and development of innovative products to meet our clients' needs. All our systems are applied by trained specialist applicators to ensure the best possible results.

Our UCRETE production facilities operate to an environmental management system audited to ISO 14001 and a quality management system audited to ISO 9001. In the chemical industry UCRETE performs a number of functions:

- It protects concrete and mild steel structures from aggressive chemicals
- It provides containment of accidental spillages so protecting the environment
- It provides a safe surface for foot and vehicular traffic
- It helps control unwanted static electricity that could affect electronic devices or cause powder or solvent explosions.

To perform all these functions correct specification, a well designed substrate and good detailing are required. We achieve this by good communication with designers, users and constructors of chemical facilities.

With BASF you are working with a partner who wants to know and understand your requirements and who will take a holistic approach to find the best solution to meet your needs. For your local partner visit www.ucrete.basf.com





Temperature Resistance

The unique UCRETE heavy duty polyurethane resin systems do not start to soften until temperatures of 130 °C are exceeded. Together with the high resilience of

UCRETE floors, this enables them to withstand high temperatures and extreme thermal shock conditions. UCRETE industrial flooring is able to withstand routine and regular discharges of boiling water.

It is clear that in extreme thermal shock environments a good quality well designed substrate is required. In particular the potentially large thermal movements of the substrate must be allowed for.

Increasing thickness protects the bond line from the enormous stresses of an extreme thermal shock event. UCRETE presents a range of four separate thickness specifications, ranging from 4 mm to 12 mm, suitable for the most extreme environments

Small spillages do not carry enough energy to damage a UCRETE floor. A cup of coffee at 95 °C would not damage a 4 mm floor, for example.

Please note that temperature has a big effect upon the reactivity and aggressivity of chemical agents. The resistance to chemicals at high temperatures should be confirmed by reference to the chemical resistance tables or your local BASF Construction Chemicals office.

Thickness specifications

4 mm

fully resistant to 60 °C
UCRETE RG, MF, MT, DP

6 mm

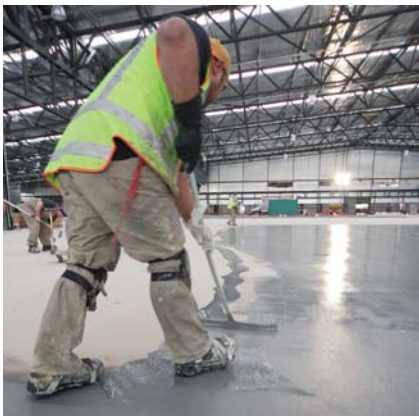
fully resistant to 80 °C and light steam clean
UCRETE RG, MT, DP, UD200, UD200SR

9 mm

fully resistant to 120 °C and full steam clean
UCRETE RG, DP, UD200, TZ, UD200SR, IF

12 mm

fully resistant to 130 °C occasional spillage
up to 150 °C and full steam clean
UCRETE UD200, TZ, UD200SR





Antistatic Flooring

Wherever solvents are used or stored there is a potential risk of explosive vapour/air mixtures forming. An electrostatic discharge can provide sufficient energy to ignite such a mixture, often resulting in an explosion.

Similarly, wherever fine organic powders are handled or generated during processing, these too can form powder/air mixtures with the potential for a dust explosion if ignited.

UCRETE antistatic floors provide the chemical and solvent resistance required of a floor in process areas or secondary containment bunds together with the static conductive properties required for the control of undesirable static electricity.

Antistatic floors are available with a range of surface profiles from smooth and terrazzo floors for clean room areas to profiled floors suitable for greasy environments and tanker loading bays, for example.

An antistatic floor can only play a part in the elimination of undesirable static discharge and must be seen as an integral part of a total strategy. For example the design and earthing of plant and equipment, the use of barrel clamps as well as correct footwear and clothing. For further guidance the British Standard BS 5958 'Code of practice for control of undesirable static electricity' refers.

UCRETE antistatic floors work by dissipating static electricity to earth. In order to prevent personnel working in the area from becoming charged through induction or triboelectrically, personnel must be in electrical contact with the floor, which requires the wearing of antistatic footwear.



Undesirable static electricity

- leads to unwanted dust accumulation
- can cause discomfort
- can damage electronic equipment
- can ignite solvent/air or air/powder mixtures

Resistivity to EN 1081

UCRETE MFAS	$R_g < 10^6 \Omega$
UCRETE DP10AS	$R_g < 10^6 \Omega$
UCRETE DP20AS	$R_g < 10^6 \Omega$
UCRETE TZAS	$R_g < 10^6 \Omega$



Chemical Resistant Flooring

Chemical	Conc. %	Temp. °C	UCRETE® All grades	Chemical	Conc. %	Temp. °C	UCRETE® All grades
Acetaldehyde	100	20	R	Isopropanol	100	20	R
Acetic acid	10	85	R	Jet fuel	—	20	R
	25	20	R	Kerosene	—	20	R
	25	85	L	Lactic acid	5	20	R
	40	20	R		25	60	R
	99 (Glacial)	20	L		85	20	R
Acetone	100	20	L		85	60	R
Adipic acid	Saturated	20	R	Lauric acid	100	60	R
Ammonium hydroxide	28	20	R	Maleic acid	30	20	R
Aniline	100	20	R	Maleic anhydride	100	20	R
Antifreeze				Methacrylic acid	100	20	R
(Ethylene glycol)	100	20	R	Methanol	100	20	R
Aqua regia	—	20	L	Methylated spirits	—	20	R
Beer	—	20	R	Methylene chloride	100	20	L
Benzene	100	20	L	Methyl ethyl ketone	100	20	L
Benzoic acid	100	20	R	Methyl methacrylate	100	20	R
Benzoyl chloride	100	20	R	Milk	—	20	R
Blood	—	20	R	Mineral oils	—	20	R
Brake fluid	—	20	R	Motor oil	—	20	R
Brine				“N, N-dimethyl acetamide”	100	20	NR
(Sodium chloride)	Saturated	20	R	N-methyl pyrrolidone	100	20	NR
Butanol	100	20	R	Nitric acid	5	20	R
Calcium chloride	50	20	R		30	20	R
Calcium hypochlorite	Saturated	20	R		65	20	L
Caprolactam	100	20	R	Oleic acid	100	20	R
Carbon disulphide	100	20	L		100	80	R
Carbon tetrachloride	100	20	R	Oleum	—	20	L
Chlorine water	Saturated	20	R	Paraffin	—	20	R
Chloroacetic acid	10	20	R	Perchloroethylene	100	20	R
	50	20	L	Phenol	5	20	L
Chloroform	100	20	L	Phenyl sulphuric acid	10	20	R
Chromic acid	20	20	R	Phosphoric acid	40	85	R
	30	20	R		50	20	R
Citric acid	60	20	R		85	20	R
Copper (II) sulphate	Saturated	20	R	Picric acid	50	20	R
Cresols	100	20	L	Propylene glycol	100	20	R
Crude oil	—	20	R	Potassium hydroxide	50	20	R
Cyclohexane	100	20	R	Skydrol® 500B4	—	20	R
Decanoic (Capric) acid	100	20	R	Skydrol® Ld4	—	20	R
	100	60	R	Sodium hydroxide	20	20	R
Diethylene glycol	100	20	R		20	90	R
Dimethyl formamide	100	20	NR		32	20	R
Ethanol	100	20	R		50	20	R
Ethyl acetate	100	20	L		50	60	R
Ethylene glycol	100	20	R		50	90	L
Fats	—	80	R	Sodium hypochlorite	15	20	R
Formic acid	40	20	R	Styrene	100	20	R
	70	20	R	Sulphuric acid	50	20	R
	90	20	L		98	20	L
	100	20	L	Tetrahydrofuran	100	20	L
Gasoline	—	20	R	Toluene	100	20	R
Heptanoic acid	100	60	R	Toluene sulphonic acid	100	20	R
Hexane	100	20	R	Trichloroacetic acid	100	20	L
Hydrochloric acid	10	60	R	Turpentine	—	20	R
	37	20	R	Vegetable oils	—	80	R
Hydrofluoric acid	4	20	R	Water (distilled)	—	85	R
	20	20	L	White spirit	—	20	R
Hydrogen peroxide	30	20	R	Xylene	100	20	R

R = resistant L = limited resistance NR = not resistant



Chemical Resistant Flooring

UCRETE has excellent resistance to a wide spectrum of chemicals including many organic acids and solvents that will rapidly degrade other types of resin flooring, including other polyurethane flooring systems.

Chemicals marked with 'R' in the table have little effect on UCRETE even after continuous long-term immersion. UCRETE can be used to line drains and sumps where these materials are handled.

UCRETE is suitable for use on floors in wet process areas and for lining secondary containment storage bunds where chemicals marked 'L' in the table are employed provided that there are reasonable standards of housekeeping.

Care should be taken where valves and pump seals start to leak. If these are not addressed, the leakage results in a continuous immersion environment and some surface erosion can occur.

Solvents may soften UCRETE on continuous immersion over a couple of weeks, but UCRETE will recover when the solvent is removed and the floor is allowed to dry out. In practice most solvents will evaporate before they do any damage.

In external bunds, for example, chlorinated solvents can become trapped under a layer of rain water which prevents evaporation and so creates a continuous immersion environment

Discolouration may occur due to salt deposits, contaminants in solvents, strong dyes and strong acids. This does not affect the performance of the UCRETE. Such effects are minimized by good housekeeping.

There are very few chemicals which will rapidly degrade UCRETE flooring. These are marked with 'NR' in the table.





Design Considerations

UCRETE is a unique suite of resin products used in very severe environments where it is subject to heavy impact, abrasion, extreme thermal shock and aggressive chemicals. Clearly it can only continue to provide optimum performance over a long service life if it is applied to a suitable substrate designed to withstand the stresses of the in service environment.

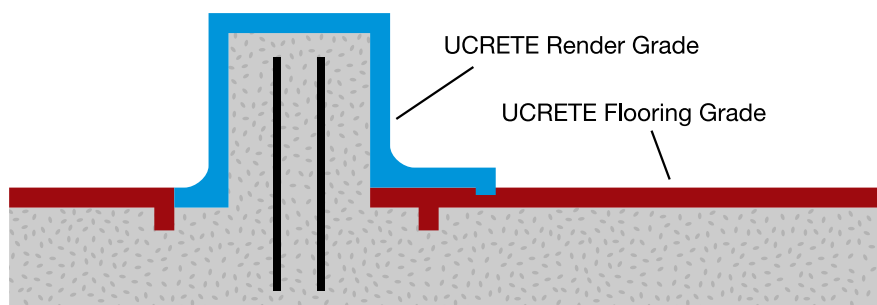


UCRETE is moisture tolerant and can be installed directly onto 7 day old concrete, for example. However a functioning Damp Proof Membrane (DPM) should be present to preclude continuous moisture ingress into the concrete from below, especially when working below ground level.

When designing external secondary containment bunds a fully welded bituthene membrane not only acts as a DPM but provides a final layer of protection to the environment.

UCRETE can be applied to a range of substrates including concrete and mild steel as well as brick and block work walls. UCRETE is ideally suited to lining mild steel mezzanine decks and access gantries in the process environment.

Low Bund Wall





A UCRETE floor or lining requires no joints. However any joints in the substrate have to be expressed through the UCRETE and filled with a suitable joint sealant.

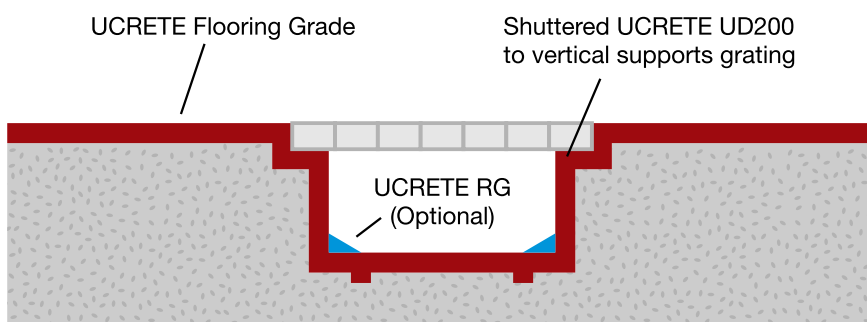
No sealant has the chemical or mechanical resistance of UCRETE so it follows that all joints are weak points in the floor or lining. Careful substrate design can eliminate the need for joints or locate them in less aggressive locations.

Drainage channels and blind sumps can be lined with UCRETE removing the abutments of resin finish to stainless steel which represent potential leak paths for aggressive chemicals. If properly designed, all the joints normally associated with channels can be eliminated. The separate document "Design and Preparation of Substrates for UCRETE® Industrial Flooring" provides further information.



CAD drawings of UCRETE design details are also available on request. Please contact your local BASF Construction Chemicals representative for further information.

Fully Lined Channel





Product Selection

UCRETE industrial flooring is a range of robust floor finishes produced using the unique UCRETE heavy duty polyurethane resin binder system. Correctly specified, UCRETE will give many years of service even in very aggressive industrial environments.



UCRETE industrial flooring offers a range of surface profiles from smooth and terrazzo systems for pharmaceutical clean room environments to highly textured defined profile floors used in external tanker reception areas.

In aggressive environments, such as drains, bunds and sumps for example, UCRETE UD200 together with UCRETE RG for the verticals should be used. The first requirement to be assessed when selecting your UCRETE floor is whether a potential explosion hazard exists necessitating an antistatic flooring system.

Then the in-service temperature conditions need to be assessed, see page 4. This determines the thickness of the floor required which may limit the number of appropriate finishes. In areas where heavy mechanical impact is expected to impinge upon the floor, then thicker systems are preferred.

A range of products are then available, which meet the safety, chemical and thermal impact requirements, with a variety of surface textures, slip resistance and aesthetics from which to choose.

The most appropriate surface texture for any particular application will depend upon the nature of any spillage to be encountered, the type of work undertaken in the area and the standards of housekeeping and cleaning to be maintained.

The choice of smooth or textured floors in process areas will depend upon the level of housekeeping and what process will take place on a wet floor. For example:

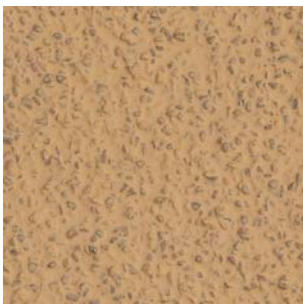
- If spillages are minor and are dealt with promptly, in clean rooms for example, a smooth floor is appropriate.
- In process areas where operatives work on a wet floor a slip resistant profile is needed.
- In a bunded area which, in the event of a leakage, may have to be accessed while noxious chemicals are on the floor, a slip resistant floor should be used even if the area is normally dry.

Your local BASF Construction Chemicals office will be pleased to advise you.

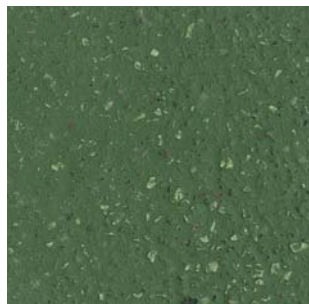


UCRETE MF	4–6 mm	smooth
UCRETE MFAS	4–6 mm	smooth, antistatic
UCRETE MT	4–6 mm	light texture
UCRETE DP10	4–9 mm	light texture
UCRETE DP10AS	6 mm	light texture, antistatic
UCRETE DP20	4–9 mm	medium texture
UCRETE DP20AS	6 mm	medium texture, antistatic
UCRETE DP30	4–9 mm	heavy texture
UCRETE UD200	6–12 mm	light texture
UCRETE UD200SR	6–12 mm	medium texture
UCRETE IF	9 mm	medium to heavy texture
UCRETE TZ	9–12 mm	terrazzo
UCRETE TZAS	9–12 mm	terrazzo, antistatic

The range of UCRETE flooring systems allows you to tailor the floor to meet your specific project needs and so achieve the most cost-effective flooring solution. For specific advice please contact your local BASF Construction Chemicals office. www.ucrete.basf.com



Cream
UCRETE DP30



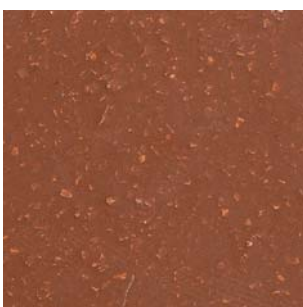
Green
UCRETE UD200SR



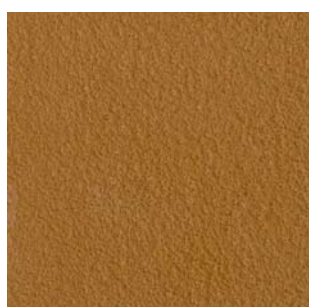
Green Brown
UCRETE MF



Red
UCRETE UD200



Orange
UCRETE DP20



Yellow
UCRETE DP10



Grey
UCRETE DP20AS

All UCRETE systems are available in these seven standard colours. Colours shown are approximate. Actual colour will vary with product grade and site conditions. UCRETE resins yellow under ultraviolet light. For further information and product samples please contact your local BASF Construction Chemicals office.



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