

# Care and Maintenance Manual

Project Name:

Client:

Date:

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# Support Structures

## Adjustable Pedestal Systems

We recommend that our adjustable pedestal products are cleaned as and when they become accessible (during routine maintenance operations for example). Cleaning can be carried out using compressed air or water hosing to free dust and debris from the pedestals.

## Floor Structure Panels

The Roof Tray product is normally manufactured from pre-galvanised steel sheet with an expected life span of 10 years. If the galvanising is chipped or the steel is exposed in any way during installation, it is recommended that this should be coated with galvanised paint to avoid corrosion.

We recommend that Roof Tray products are cleaned as and when they become accessible (during routine maintenance operations for example) laundry soaps are suitable for general cleaning. White spirits can be used to remove paint. Please ensure that the surface is rinsed with water following application of white spirits.

# Farrino Porcelain Decking

## Cleaning

Pressure wash Farrino boards a minimum of every 6 months to ensure the surface is kept clean and performs well. Tough stains can be removed using warm soapy water and a stiff brush.

## Care and Maintenance:

We recommend that our porcelain tile products have a cleaning program in place to ensure the product keeps a clean facial appearance. We would suggest this takes place once or twice a year although this can vary depending on the severity of the environment concerned.

Cleaning can be carried out using a high pressure cleaner with a fan-shaped beam at a distance of at least 20cm, in a lengthwise profile direction. Alternatively, tiles may be scrubbed using mild all-purpose cleaner and water. To keep tiled areas clean on a day-to-day basis we recommend regular sweeping followed by rinsing and brushing with water, using a soft brush and a mild all-purpose cleaner or suds.

## Disposal

Farrino waste material may be disposed of with the regular household and/or commercial waste. Larger quantities may be disposed of with bulk waste or taken directly to an appropriate waste disposal site. If in doubt, please contact your city and/or municipal administration to discuss appropriate methods of recycling.

## Validity

Our installation instructions are drawn up on the basis of current knowledge and may be adapted at any time and without prior notice. Please check if you have the most currently released version or if an update is available at [raaft.co](http://raaft.co)

## Technical Questions?

These installation instructions are designed for standard applications. Due to an unlimited variety of design options it is impossible to cover all possibilities. In case of specific installation variants, please also see our separate installation instructions at [raaft.co](http://raaft.co). In case of further questions or in case additional technical details are required, please contact us by email at [technical@raaft.co](mailto:technical@raaft.co)

# Atria Porcelain Tiles

## General Information

These instructions are designed to help you install Atria tiles properly, safely and economically. Cutting Atria porcelain tiles. Our Atria porcelain tiles must be cut with a diamond blade wet tile cutter and tool safety guides must be strictly adhered to at all times; most importantly, face and hand protection.

## Storage and Handling

In preparation for delivery, Atria tiles are securely packed into cardboard boxes to ensure no movement during transit. Depending on the size and weight of the consignment they may be palletised. Until the point of installation, the tiles should be stored fully packed in a dry environment.

## Disposal

Waste material may be disposed of with commercial waste. Larger quantities may be disposed of with bulk waste or taken directly to an appropriate waste disposal site. If in doubt, please contact your city and/or municipal administration to discuss appropriate methods of disposal.

## Cleaning and Care

Our Atria tiles are easy to clean and resistant to most chemicals. They are UV stable and have a porosity of 0.01%. We recommend that porcelain tile products should have a cleaning program in place to ensure the product keeps a clean facial appearance. We would suggest this takes place once or twice a year although this can vary depending on the severity of localised weather and climate conditions.

Cleaning can be carried out using a high pressure cleaner with a fan-shaped beam at a distance of at least 20cm, in a lengthwise profile direction. Alternatively, tiles may be scrubbed using mild all-purpose cleaner and water.

To keep tiled areas clean on a day-to-day basis, we recommend regular sweeping followed by rinsing and brushing with water, a soft brush, and a mild all-purpose cleaner or suds.

## Tile Breakage

A ceramic tile may fracture on impact if a heavy object falls on it from any significant height. Therefore we recommend you check the specific intended use before starting the installation and in certain conditions reinforcing must be applied to the back of the tiles. Failure to comply with these recommendations may lead to improper use of the product and could cause serious damage or injury. Raافت does not accept any liability caused by improper use or defective installation.

**Warning: Wind uplift can cause loose-laid porcelain tiles to lift and move.**

All roofs are subjected to the effects of wind uplift as the wind moves across them. The effects of this will depend upon a number of factors including location, height, size, roof shape and relationship to the surrounding area. In extreme cases, 2cm thick porcelain tiles have been lifted and propelled over a balustrade. It is therefore critical that a roof is analysed by a certified wind consultant and any concerns addressed with the necessary by the wind resistant solutions.

For more information, please contact our technical advisers.



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## Ground and Sub-base Suitability

The ground must be stable and properly compacted. If the ground is not sufficiently stable, this may lead to instability and potential damages to the construction and persons or property thereon.

## Permissible Loads

Atria tiles have a breaking strength of >1500N and a breaking load class of U11 and T11. Further information can be found in the [Atria 20mm Porcelain Tiles Data Sheet \(DS-APT-0222\)](#). Misapplication may lead to damage to property or person. Please consult with an authorized stress analyst or structural engineer to check suitability of proposed application. Installation of Atria tiles should be completed in compliance with all Health and Safety regulations pertaining to the application.

## Technical Questions?

These installation instructions are designed for standard applications. Due to an unlimited variety of design options it is impossible to discuss all feasible options. If further questions or additional technical details are required please contact us by email at [technical@raaft.co](mailto:technical@raaft.co) or by phone on +44 (0)20 3146 7879.

## Validity

Our installation instructions are drawn up on the basis of current knowledge and may be adapted at any time and without prior notice. Please check if you have the most currently released version or if an update is available at [raaft.co](http://raaft.co) in the Resource Centre. Valid May 2021.

## Handling and Hazards



### SHARP CORNERS AND EDGES!

Wear gloves



### HEAVY ITEMS!

Wear steel toe protection.



### HEAVY SEGMENTS!

Requires two persons to lift each segment - or mechanical lifting device.



### BE SAFE!

Wear high visibility clothing, hard hats, and any other PPE required on site.

# Anti-slip Ratings Explained

When specifying an external flooring surface you need to know what slip resistance is required so that people are kept safe. This document gives a brief outline of what these standards are and how they compare.

DIN is equivalent to British Standards and is also an accepted standard in the UK.

DIN stands for 'Deutsches Institut für Normung' or German Institute of Standardisation. It is the standard by which floor designers and architects must specify to conform with building regulations and to offset possible accident injury claims.

A ramp, laid with the flooring material to be tested, is raised in varying degrees until a person, wearing either a specified shoe type or in bare feet, slips on the floor. The test is performed a number of times using dry floors, wet flooring, and contaminated floor surfaces.

The results are averaged and an R rating is given to that floor type, that equates to its potential to prevent slips on the flat. Always use a minimum of R12 and ideally R13 rating for any slopes; even a 5-degree slope needs a minimum Pendulum Test Value (SRV) of 45.

## DIN standards compared

Standard DIN 51097 Standard of Germany used for barefoot traffic		Standard DIN 51130 Standard of Germany used for footwear traffic		CoF (Coefficient of Friction)
Group C	R13			1.00
				0.95
				0.84
				0.67
Group B	R12			0.55
				0.44
Group C	R11			0.33
				0.27
Group C	R10			0.21
	R9			

## Standard DIN 51130: 2004

German National Standard 2004 used for Footwear traffic.

DIN 51130 uses heavily-cleated EN:ISO 20345 safety boots with motor oil contamination.

Testing of floor coverings; determination of the anti-slip properties; workrooms and fields of activities with slip danger; walking method; ramp test - fully recognised and adopted in the UK.

### DIN 51130 R-Value slipperiness classification

CLASSIFICATION	PTV (PENDULUM TEST VALUE)	SLIP ANGLE (°)	DESCRIPTION	USES
R9	11 - 18	6 - 10	Low Friction High slip risk	Suitable for dry internal domestic floors, e.g. kitchens, dining areas, hallways.
R10	18 - 34	10 - 19	Medium Friction Moderate slip risk	Suitable for internal domestic floors subject to occasional wetting, e.g. bathrooms.
R11	34 - 51 *(See Note below)	19 - 27	High Friction Low slip risk	Suitable for external areas e.g. patios and walkways, dressing rooms, public toilets.
R12	51 - 70	27 - 35	High Friction Low slip risk	Suitable for external areas e.g. patios and walkways, dressing rooms, public toilets.
R13	70 +	35+	High Friction Low slip risk	Suitable for slopes and high-resistance requirement external areas e.g. sloped walkways in wet areas.

## Standard DIN 51097:1992

A German standard that tests slip resistance of flooring in barefoot conditions using soapy water as a contaminant.

DIN 51097 testing is suited to swimming pools and wet rooms, areas generally only accessible when barefoot.

The test provides a good indication of wet slip resistance.

### Ramp test DIN 51097 - floor 'ABC' ratings for bare feet

ABC RATING VALUE	PTV (PENDULUM TEST VALUE) CoF	SLIP ANGLE (°)	SLIP RISK	USES
A	0.21 - 0.31	12 - 17	High/Moderate	Dry barefoot areas.
B	0.32 - 0.42	18 - 23	Moderate/Low	Pool surrounds & showers.
C	0.44 +	24+	Low	Wet ramps, walk through pools & jacuzzi floors.



## BS EN 13036-4:2011 Pendulum Test

The Floor Pendulum Testing method for measurement of slip/skid resistance of a road and airfield surface. British Standard BS 13036-4: 2011 describe the method of conducting Floor Pendulum Testing on pedestrian surfaces. The HSE Approved Pendulum Test accurately replicates the Dynamical Coefficient of Friction (CoF) or in layman’s terms ‘Heel Slip’ on floor surfaces.

PTV RATING	EQUIVALENT	DESCRIPTION	USES
11 - 18	R9	Low Friction	Suitable for dry internal domestic floors, e.g. kitchens, dining areas, hallways.
18 - 34	R10	Medium Friction	Suitable for internal domestic floors subject to occasional wetting, e.g. bathrooms.
34 - 51	R11	High Friction	Suitable for external areas e.g. patios and walkways, dressing rooms, public toilets.

PTV (PENDULUM TEST VALUE)	PROBABILITY OF SOMEONE SLIPPING	SLIP RISK
19	1 : 2	High
24	1 : 20	High
27	1 : 200	Moderate
29	1 : 10,000	Moderate
34	1 : 100,000	Moderate
36	1 : 1,000,000	Low

A PTV of 36 = 1 in 1 Million Probability of Slip  
 A PTV of 34 = 1 in 100,000  
 A PTV of 24 = 1 in 20 – Every 20th person might slip



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 w: [raaft.co](http://raaft.co)

# Fire Ratings Explained

## Insight into fire ratings for building materials

### EN 13501-1:2007 – Reaction to Fire

European Standard for Fire classification of construction products and building elements.

Classification using data from reaction to fire tests (+A1:2009)

### EN 13501-1: Fire Test to Building Material-Classification – Split in to three areas

CONSTRUCTION CLASSIFICATION (EXCLUDING FLOORING)	Class F	Test according EN ISO 11925-2 and failure to meet the Class E
	Class E	Pass the test according to the EN ISO 11925-2
	Class D, C, B	Pass the test according to EN ISO 11925-2 and EN 13823
	Class A2	Pass the test according to EN 13823 and EN ISO 1182 or EN ISO 17160
	Class A1	Pass the test according to EN ISO 1182 and EN ISO 1716

FLOORINGS CLASSIFICATION	Class Ffl	According EN ISO 11925-2 to test and fail to meet Class Efl
	Class Efl	Pass the test specified according to EN ISO 11925-2
	Class Dfl, Cfl, Bfl	Pass the test according to EN ISO 11925-2 and ISO 9239-1
	Class A2fl	Pass the test according to ISO 9239-1 and EN ISO 1182 or EN ISO 1716
	Class A1fl	Pass the test according to EN ISO 1182 and EN ISO 1716

LINEAR PIPE	Class FL	Test according to EN ISO 11925-2 and fail to meet the Class E
	Class EL	Pass the test according to the EN ISO 11925-2
	Class DL, CL, BL	Pass the test according to EN ISO 11925-2 and EN 13823
	Class A2L	Pass the test according to EN 13823 and EN ISO 1182 or EN ISO 1716
	Class A1L	Pass the test according to EN ISO 1182 and EN ISO 1716

## Classification according to European Standard EN 13501-1

DEFINITION	CONSTRUCTION PRODUCTS			FLOORINGS	
	A1			A1fl	
Non-combustible materials	A2 - s1 d0	A2 - s1 d1	A2 - s1 d2	A2fl - s1	A2fl - s2
	A2 - s2 d0	A2 - s2 d1	A2 - s2 d2		
	A2 - s3 d0	A2 - s3 d1	A2 - s3 d2		
Combustible materials - very limited contribution to fire	B - s1 d0	B - s1 d1	B - s1 d2	Bfl - s1	Bfl - s2
	B - s2 d0	B - s2 d1	B - s2 d2		
	B - s3 d0	B - s3 d1	B - s3 d2		
Combustible materials - limited contribution to fire	C - s1 d0	C - s1 d1	C - s1 d2	Cfl - s1	Cfl - s1
	C - s2 d0	C - s2 d1	C - s2 d2		
	C - s3 d0	C - s3 d1	C - s3 d2		
Combustible materials - medium contribution to fire	D - s1 d0	D - s1 d1	D - s1 d2	Dfl - s1	Dfl - s1
	D - s2 d0	D - s2 d1	D - s2 d2		
	D - s3 d0	D - s3 d1	D - s3 d2		
Combustible materials - high contribution to fire	E	E - d2		Efl	
Combustible materials - easily flammable		F		Ffl	

### Smoke

RATING	DEFINITION
s1	Little or no smoke generation
s2	Medium smoke generation
s3	Heavy smoke generation

### Burning droplets

RATING	DEFINITION
d0	No droplets within 600 seconds
d1	Droplets form within 600 seconds but do not burn for more than 10 seconds
d2	Not as d0 or d1

# Steel Planters

## Corten A Steel Planter Systems

We recommend that Corten products should have a cleaning program in place to ensure the product keeps a clean facial appearance. We would suggest this should take place twice a year although this can vary depending on the severity of localised weather and climate conditions.

Cleaning can be carried out using compressed air or water hosing to free dust and debris from the structure. Any surfaces not accessible for inspection and maintenance must be painted or coated. Painted Corten products should follow the 'Powder Coated Planter Systems' protocol below.

## Untreated Steel Planter Systems

Untreated products should be maintained in the same manner as Corten products.

## Galvanised Steel Planter Systems

Galvanised steel planters will benefit from inspection and cleaning after installation. If the galvanising is chipped or the steel is exposed in any way, it is recommended that this should be coated with galvanised paint to avoid surface corrosion.

Cleaning should take place once or twice a year. A hard plastic bristle brush is recommended as steel bristle brushes can cause discolouration. If aesthetics are a concern, we would suggest you trial an inconspicuous area first.

Laundry soaps are suitable for general cleaning. White spirits can be used to remove paint. Please ensure that the surface is rinsed with water following application of white spirits

## Powder Coated Planter Systems

Once powder coated planters arrive on site it is important to store them indoors or under shelter in a cool, dry environment out of direct sunlight and rain whilst it is in a packaged state. This will ensure that there is no discolouration or transfer of carefully applied protective packaging.

Powder coatings can be treated like most other paints and will benefit from regular washing. If the powder coating is chipped or the steel is exposed in any way, it is recommended that this should be 'touched up' using external grade paint.

Cleaning should take place every 6 months. A mild detergent applied by cloth, sponge or soft brush should be used. The aesthetic life will be prolonged by waxing or polishing with good quality car shampoos and waxes.

## Stainless Steel Planter Systems

Stainless steel planters should require minimal maintenance, particularly in external applications, but occasional cleaning is still recommended. The important thing with stainless steel is to simply clean the metal when it is dirty.

Washing with soap or a mild detergent is recommended and this should be followed by a clean water rinse. Sponges or cloths should be used for general cleaning. A fibre brush can be used for more stubborn stains. Raافت recommend Grade 316 stainless steel for external applications.

# Planter Care & Maintenance

## Cor-Ten<sup>®</sup> Steel

The following information is intended as a brief technical reference guide to Cor-ten steel.

### How Cor-ten Works

In the presence of water and air, all low alloy steels rust at various rates according to the amount of oxygen present in the atmosphere. With conventional steels, the rust layer becomes non-adherent and detaches from the metal surface – reducing the thickness of the material and consequently the effectiveness of the steel.

With Cor-ten steel, the process of rusting is initiated in the same way but the alloying elements used, e.g. chrome and copper etc., react to produce a 'patina' or (oxide film) which is much more dense and therefore adheres tightly to the base metal. As the oxidation process develops over time, the 'patina' impedes the access of oxygen and moisture to the metal surface, thus reducing the 'rusting process' considerably, giving increased performance to the steel.

The rapidity with which the steel develops its protective oxide film depends mainly upon the nature of the environment and exposure to the elements. In an industrial atmosphere, the weathering process will be quicker (particularly in the presence of sulphur), and the colour of the 'patina' darker than in a rural atmosphere.

Owing to the warming and drying action of the sun, metal surfaces exposed to the south and west (in the Northern Hemisphere) develop a smoother, more uniform 'patina' than those facing east and north. Higher temperatures permit more rapid conversion/dehydration of the corrosion products, whereas surfaces exposed away from the sun react more slowly; where the 'patina' may exhibit a somewhat granular texture.

### Using Cor-ten Unpainted

Cor-ten is not a completely maintenance-free material. It should be inspected periodically according to its design and conditions of use to see that all joints and surfaces are performing satisfactorily. If necessary, maintenance is usually by cleaning with compressed air or water hosing to free dust and debris from the structure. Any surfaces not accessible for inspection and maintenance must be painted or coated.

- Cor-ten has been designed and manufactured to give excellent performance in particular and demanding applications. To obtain optimum performance from Cor-ten in the unpainted condition, the following points should be noted:
- To provide a sound, uniform surface for the formation of the protective 'patina', all exposed, unpainted Cor-ten surfaces (including welded areas) must be suitably prepared. The hot-rolled products should be blasted clean or pickled. Cold reduced and pickled sheets need only be cleaned to remove grease, oil or foreign products.
- Design features that could or will collect or retain water must be avoided such as pockets, crevices etc.
- Since any interruption in the surface can cause the oxide coating to develop unevenly, designers should consider the effect of the system construction, e.g. welding (see section on welding).



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- Moisture dripping from the steel, especially during the early years of exposure, will contain soluble iron salts which can stain or streak adjacent materials. This run off is particularly concentrated during the early years of 'patina' formation. This natural process in no way affects the performance of the steel. Designers have used gutters, pipes and dripping rims for the systematic drainage of this natural solution. Materials subject to minimal staining include glass, ceramic tile, glazed brick, porcelain coatings, washable air-drying and thermosetting organic coatings, extruded neoprene, and stainless steels. Materials subject to severe staining are concrete and stucco, galvanized steel, unglazed brick, matte porcelain enamels, stone, and wood.
- Damp debris on Cor-ten or contact with any materials which may retain moisture will accelerate corrosion.
- Interior surfaces of Cor-ten structures must be protected as though the material were ordinary-carbon steel.
- Unpainted Cor-ten is not suitable for severe marine or industrial environments.
- Applications which involve total submersion must be protected in a way which extends well above the ground line or high water line.
- Overlapping joints which may be subject to capillary action should be painted or sealed.
- Sealants that perform satisfactorily with Cor-ten are readily available.
- It may be necessary to paint Cor-ten which is in contact with other structural materials if galvanic reaction is a possibility.
- Materials used to mark Cor-ten for identification purposes should contain non-indelible compounds, or Cor-ten should be marked in areas that will be hidden after completion. Otherwise, marks will remain visible for many years unless blast cleaned after construction.
- The interior and all other unexposed surfaces of weather-resistant steel fascias can be prone to moisture accumulation from numerous sources including capillary action and condensation. The designer must therefore exercise great care in the detailing of such elements, ensuring that they are well ventilated and self-draining with no possibility of moisture entrapment.

## Painting and Protection

In certain circumstances, which prevent the 'patina' forming, Cor-ten will require the same paint procedure as for carbon steel. It has been shown that Cor-ten prevents under-creep at areas of damage or degradation of the paint film. This will be beneficial as the areas of touch-up and repaint will not grow to any great extent, even after a prolonged period of time. Any damaged areas of bare metal will be protected by the subsequent forming of the protective oxide 'patina'.

## Environmental Considerations.

Cor-ten has been extensively used throughout the world where environmental considerations have been of prime importance such as the necessity to blend high strength steel structures with the natural environment. There are, however, a number of environments where Cor-ten cannot be used in its unpainted condition.

- In atmospheres where high concentrations of strong chemical or industrial fumes are present.
- Submerging in water or underground. In both cases, the performance will be the same as with carbon manganese steels.
- Conventional methods of protection such as concrete encasements, cathodic protection or a high quality paint system extended well above the water line and ground level can be used.
- Where the steel would be exposed to high concentrations of chloride ions which would occur from salt-water spray, salt fogs or airborne salts from a coastal environment.
- Salt adversely affects the 'patina' and because of its hygroscopic nature maintains a continuously damp environment on the metal surface.

# Planter Care & Maintenance

## Fabrication

### Cold Forming

Cor-ten steel sheet/plate can be formed using conventional means with good fabrication practices.

The higher strength of Cor-ten means that it is necessary to use slightly greater forming pressures with more liberal bending radii than those normally used for mild steel to accommodate increased spring-back.

For sheet and plate up to 6mm thick, the minimum recommended internal forming radius is twice the thickness of the material.

For plate from 6mm to 13mm thick, the minimum recommended internal forming radius is three times the thickness of the material.

### Cutting

Flame cutting e.g. oxy-acetylene, oxy-propane or plasma arc cutting can be carried out using the same procedures as with high yield carbon manganese steels of similar CEV and thickness.

To avoid excessive hardening of the flame cut edges, and hence the danger of cracking; as a general rule, preheat temperatures similar to those of welding should be used.

### Welding

Cor-ten has been used extensively in welded structures throughout the world. Cor-ten may be welded with the same facility as ordinary mild steel. However, its greater strength should be considered when selecting a welding procedure. For all welding procedures, appropriate minimum preheat temperatures should be used.

Although welding is straightforward, special procedures may be necessary to give matching weathering properties of the weld when the sheets/plates are to be used in exposed conditions.

In general, single pass welds can be carried out with carbon steel electrodes since there is usually sufficient pick-up of alloying from the parent material to give matching weathering characteristics. If multi-pass weld procedures are to be applied, special electrodes are required.



## High Temperature Applications

Although Cor-ten steel was not developed for high temperature applications, subsequent test data has shown that the elevated temperature properties of Cor-ten steel are superior to those of plain carbon structural steels.

Cor-ten A and, to a lesser extent, Cor-ten B have been used successfully in a number of non-critical applications that have not required specific pressure vessel alloy steels such as Cr-Mo.

Cor-ten A is of a greater interest than Cor-ten B for high temperature applications such as ductwork, chimneys and incinerators. Even in the absence of moisture at temperatures above 400°C, the 'patina' will still form.

At temperatures of about 425°C and higher, Cor-ten A exhibits much better elevated temperature ductility than Cor-ten B.

Tension, creep, and creep rupture tests conducted on Cor-ten A steel containing 1% chromium showed that the steel exhibits attractive high temperature properties up to 540°C (1000°F).

Examination of oxidation behaviour shows that there is an improvement by some 50 degrees Celsius in oxidation resistance of Cor -Ten in the 500-700°C range for the same conditions. For example, under conditions which give 1mm/year oxidation loss on carbon or carbo/manganese steels, the temperature to give this loss on Cor-ten would be 50°C higher.

The precise improvement obtained with weather resistant steels is greatly dependent on the heating cycle experienced by the material and upon the environmental conditions prevailing.

NB. Cor-ten is not suitable for use in significant load bearing members above 450°C (approx.).

# Steel Corrosion Data

SOIL TYPE	SINGLE SIDED EROSION (MM)				
	INTENDED LIFESPAN				
	5 YEARS	25 YEARS	50 YEARS	75 YEARS	100 YEARS
Dense clean soils	0.00	0.30	0.60	0.90	1.20
Contaminated loose soil	0.15	0.75	1.50	2.25	3.00
Acidic soil	0.20	1.00	1.75	2.50	3.25
Very dense soil (e.g. clay)	0.18	0.70	1.20	1.70	2.20
Aggressive soil	0.50	2.00	3.25	4.50	5.75

## Description

The above table displays corrosion data applicable to the Raaft range of steel edgings and planters. The values show the amount of mm that “disappear” over a set number of years (5, 25, 50, 75, 100). These numbers are based on flat standard construction steel sheet S235, in contact with damp soil on one side. The results for CorTen A steel will be equal or better.

Soil type is a key factor. The more aggressive the soil, the greater the levels of erosion.

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# Timber

## Iroko



Iroko is a highly durable hardwood that is both insect and rot resistant, making it the ideal type of wood for street furniture products.

In external applications, Iroko wood should be left untreated without oiling to weather naturally as this will ensure best durability and consistency.

# Timber

## European Oak



Following this regular maintenance regime, particularly early in the service life of the joinery, will help maintain Oak's decorative appearance and reduce the need for more time consuming maintenance at a later stage.

### How do I clean the oak?

Regular washing down with a mild detergent solution will help to remove surface contaminants.

### Some cracks and splits have appeared in the oak

We recommend all external joints, gaps and end-grain are inspected and any defects repaired. If joints have opened, reseal them with break joint and end-grain sealers and if surface splits have opened; patch repair the protective coating with the appropriate topcoat.

# Timber

## European Oak (continued)

### The Oak is changing colour, why is this and how can I stop it?

Oak naturally greys and discolours in sunlight regardless of the coating system applied or how much 'UV protection' the coating claims to offer. A light tint in the coating helps to disguise this "greying" and mask the patchy appearance which can be evident in the early stages as the sunlight bleaches the timber surface.

Discolouration usually results from moisture ingress either through open joints and gaps or where the timber surface has split; disrupting the protective coating. When this occurs the surface of the underlying timber will turn black as the moisture reacts with the Oak's naturally occurring tannic acid. The blackening is not rot, and does not affect the structural integrity of the timber, but it can be visually unappealing. Where only localised 'blackening' has occurred, a detailed sander, is often the quickest way to remove the affected layer. Feather back the sanded area into the surrounding unaffected area then reinstate the coating system. If more extensive blackening has occurred, chemical treatment will be necessary.

The discolouration is typical of that caused by moisture reacting with the natural acidic tannins in the oak surface and occurs where the protective coating is mechanically disrupted either by joints opening, the surface splitting, or warping or twisting of the wood section. If staining is extensive, the black colour can be removed using a solution of Oxalic acid. This treatment will return the Oak surface to an even tone similar to its original colour and the protective finish can then be reapplied once any remedial work on joints etc. has been completed.

Before treatment, remove the protective coating from the affected timber. This is best done with a detail sander using a coarse, then fine, grit pad. Oxalic acid is supplied as dry crystals and is available from most hardware stores or on the internet.

To treat discoloured Oak, make up a saturated solution of the crystals in a plastic bucket using approximately 4 tablespoons of Oxalic acid crystals to 1 pint of hot water.

Treatments will raise the grain of the wood, which must be allowed to dry thoroughly (at least overnight) before sanding down the raised grain with a fine grade sanding pad.

Repair any defects in the joinery, and reinstate the protective coating system, remembering to reseal all joints and end grain.

# Disclaimer

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