COATINGS RADAR

Handbook

Contents

Innovation **Interactive** **Intelligence**

European Rust Scale and General Corrosion

The Re Scale is a widely used international reference for assessing the level of rusting on a coated surface. It is based on the "European Scale of Degree of Rusting for Anticorrosive Paints," which was developed in the 1960s and is still relevant today. This document includes black and white photographs of different degrees of rusting on a steel substrate coated with an oil-based air-drying anticorrosive paint.

Re Scale

Re 0

Re 1

Re 2

Re 3

Re 4

Re 5

Re 6

Re 7

Re 8

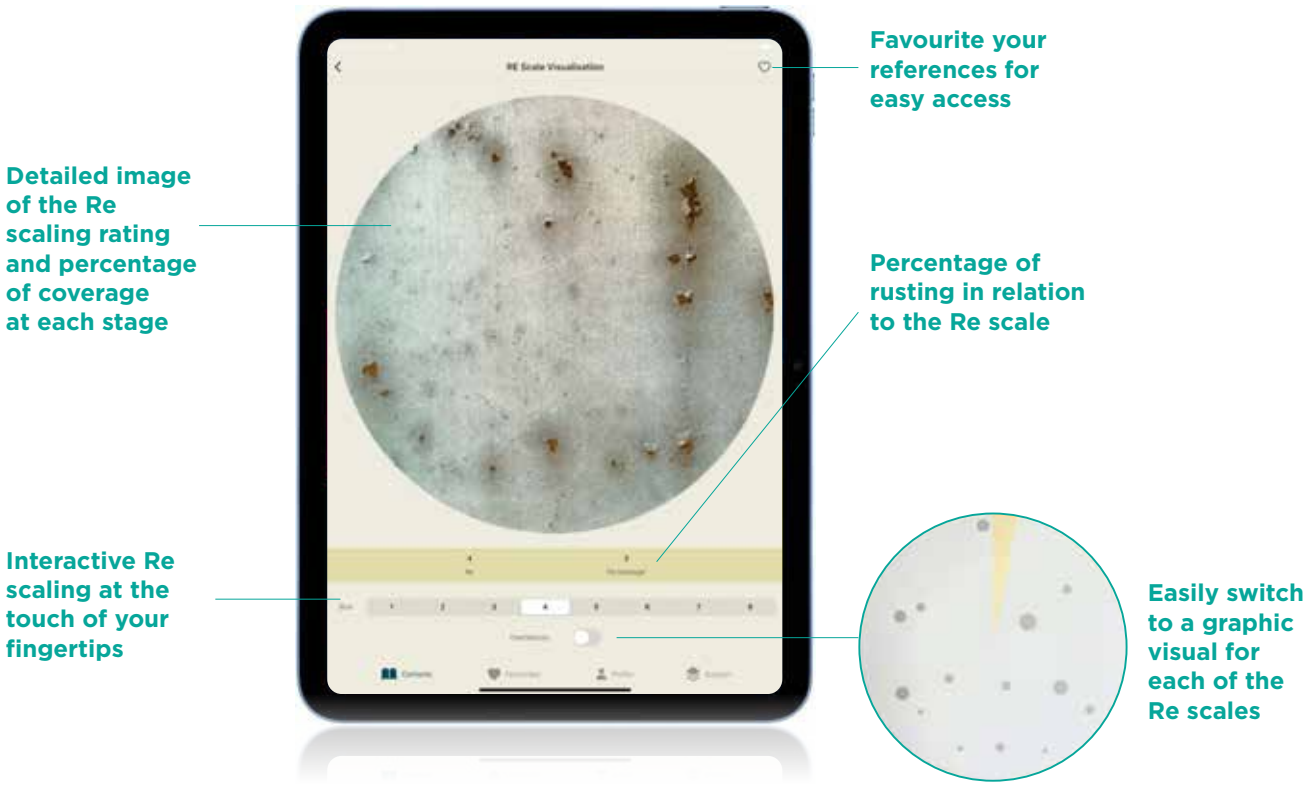
Re 9

The Re Scale comprises ten photographs, ranging from Grade Re 0 to Grade Re 9. Grade Re 0 indicates no visible corrosion, while Grade Re 9 represents 95% visible corrosion. Coatings Radar provides examples of the Re Scale in various colours to simplify identification on coloured-coated surfaces.

The Coating Radar app also offers examples of actual structures (marine, offshore, wind, petrochemical) with variable degrees of corrosion as per the Re Scale.

Re Scale Visualisation

A re-scale visualisation is included within the Coatings Radar App detailing the re-size and percentage of rust on an interactive slide.



ONE OF A KIND
Interactive Re Scale all in 1 App

Rating Schemes

Several tables and charts are included within the Coatings Radar App –

- Re Evaluation – Details of the Re Scale (Re 0-9) and corresponding percentages of rust on a coated surface
- Comparison of ASTM D610, ISO 4628-3 and The European Rust Scale
- Alternative Assessment Diagrams
- Coating Breakdown (Localised)
- Coating Breakdown (Scattered)

Marine

A full and detailed explanation of Rust Staining and General Staining is Included in the Coatings Radar App.

Good Condition

The IACS documents have several photographs of in-service tank coatings in good condition.

Fair Condition

The IACS documents have several photographs of in-service tank coatings in fair condition.

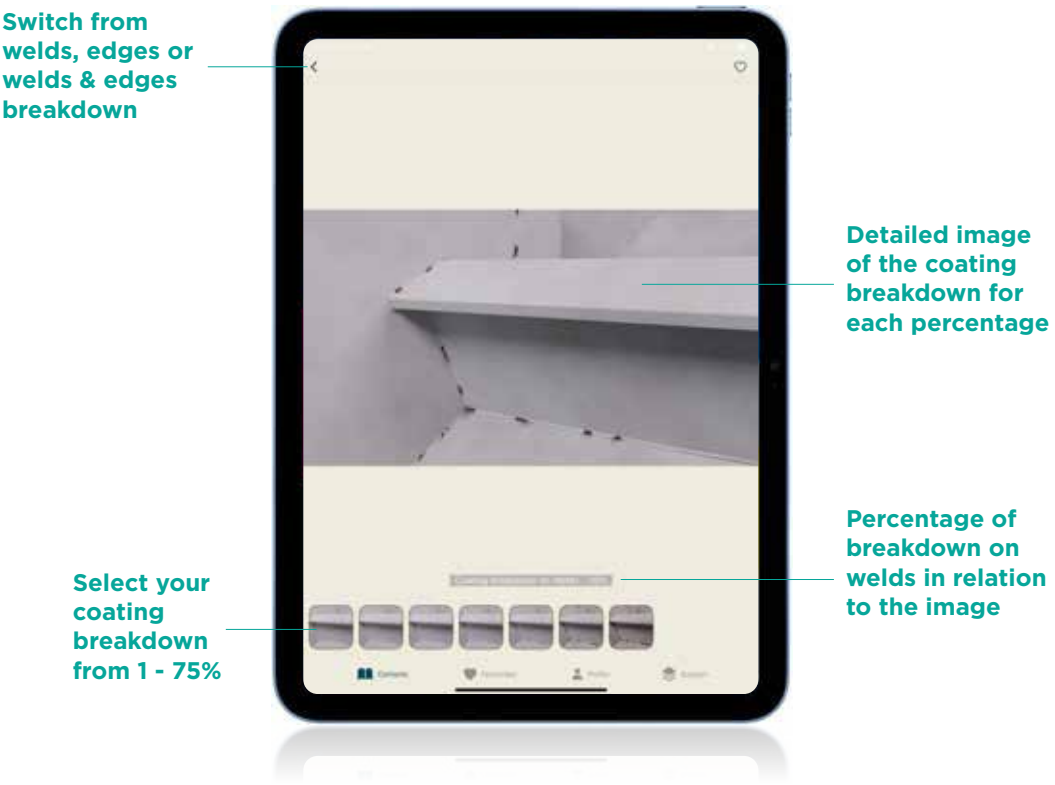
Poor Condition

The IACS documents have several photographs of in-service tank coatings in poor condition.

Coatings Radar App includes IACS clarification details on good, fair, and poor coating conditions.

Welds and Edges

Coatings Radar App includes an interactive section on the percentage calculation of coatings breakdown:



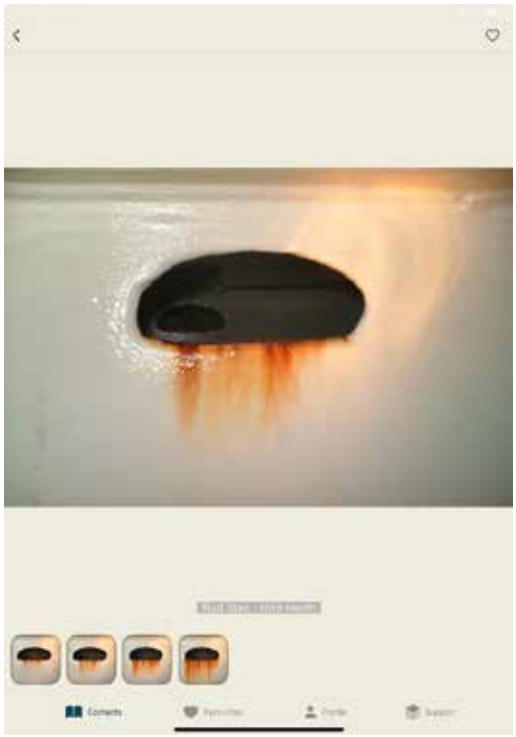
A document review is included in the IACS Recommendation 87 “Guidelines for Coatings Management and Repairs for Ballast Tanks and Combined Cargo/ Ballast Tanks on Oil Tankers”.

The Coatings Radar App is ideal for assessing the condition of in-service coatings used in marine environments. It can determine the overall condition of the coatings and the vulnerable locations for coating breakdown, including welds and edges.

Rust Staining

A full and detailed explanation of Rust Staining and General Staining is Included in the Coatings Radar App

Detailed Images



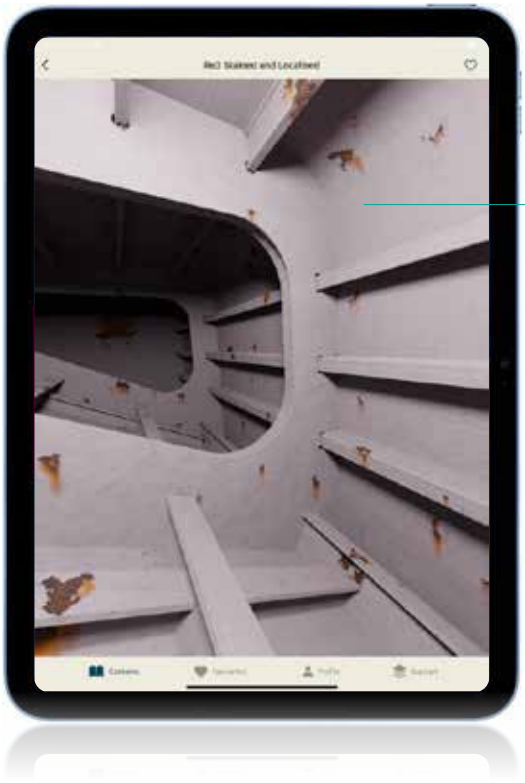
Month by Month rust staining is detailed in the Coatings Radar App.

Live Videos

Live video of rust staining to ‘in situ’ coatings is also contained within the Coatings Radar App.

Interactive

Coatings Radar App includes 360° stained tanks – Localised and Scattered Gallery for Double Bottom Tanks and Wing Tanks.



360°

Detailed 360° image of stained tanks

App Available for download

The Coatings Radar App considers the coating assessment on aged coatings subject to a salt-laden environment with the use of videos, photographs and live videos.

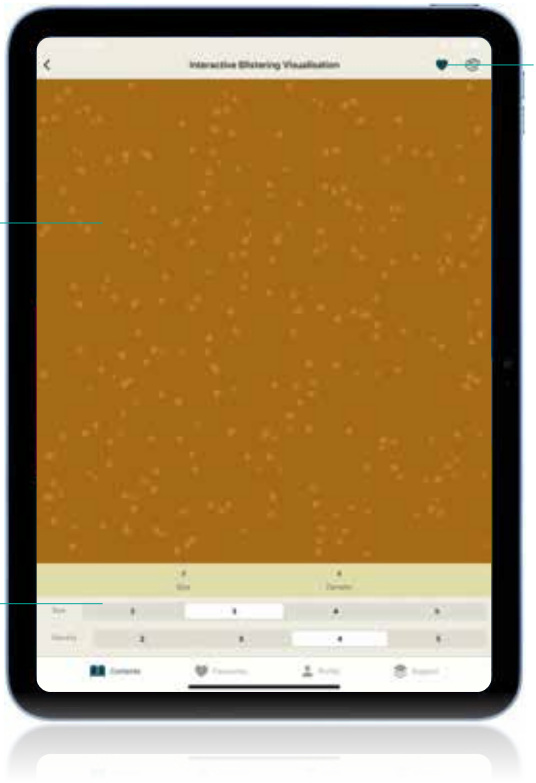
Paints and Varnishes

ISO 4628 is the evaluation of degradation of coatings – designation of quantity and size of defects, and of intensity of uniform changes in appearance and has ten parts. Coatings Radar details four of the defects for interactive evaluation of coatings.

- Blistering (ISO 4628-2)
- Rusting (ISO 4628-3)
- Cracking (ISO 4628-4)
- Flaking (ISO 4628-5)

Blistering Tools

An interactive blistering visualisation is detailed in the app. You can set the blister size, density and paint colour.



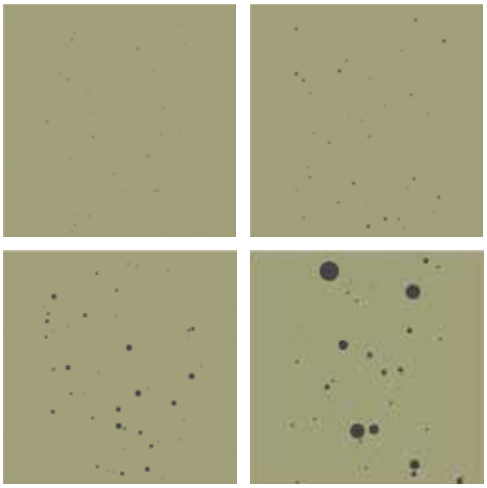
Correlation Table

A blistering correlation table is included in the Coatings Radar App comparing ISO 4628-2 and ASTM D 714

Live videos of Blistering are included in the Coatings Radar App

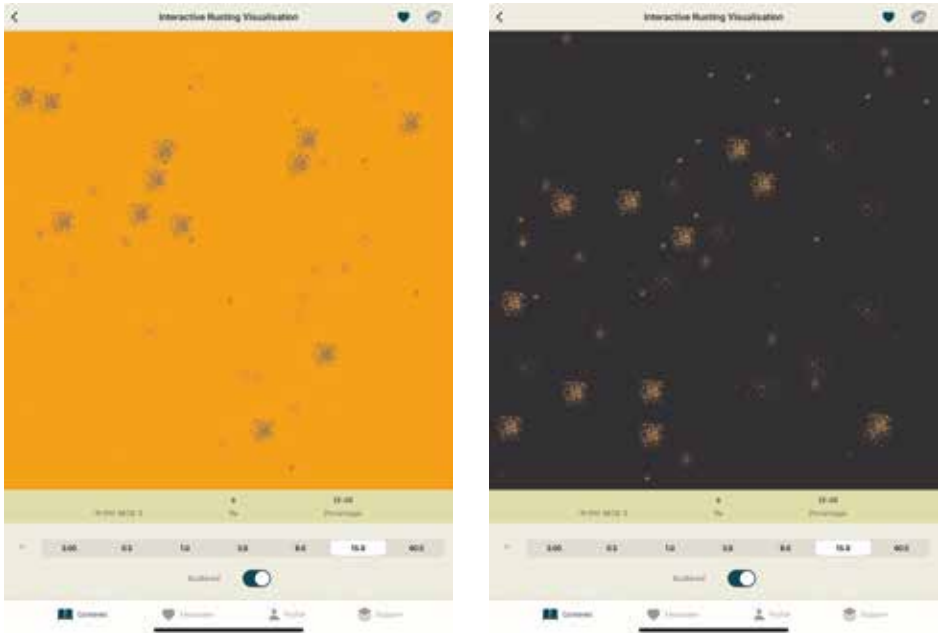
Also included:

- An overview of the ISO 4628-2 is also detailed.
- Blistering Sizes 2, 3 , 4 and 5 are included and include quantity and density



Rusting Tools

An Interactive rusting visualisation is detailed in the app. You can set the percentage of rust which compares the Re Scale number and paint colour. Localised and scattered rust is detailed.



Various other colour options are available

Degree of Rusted Area

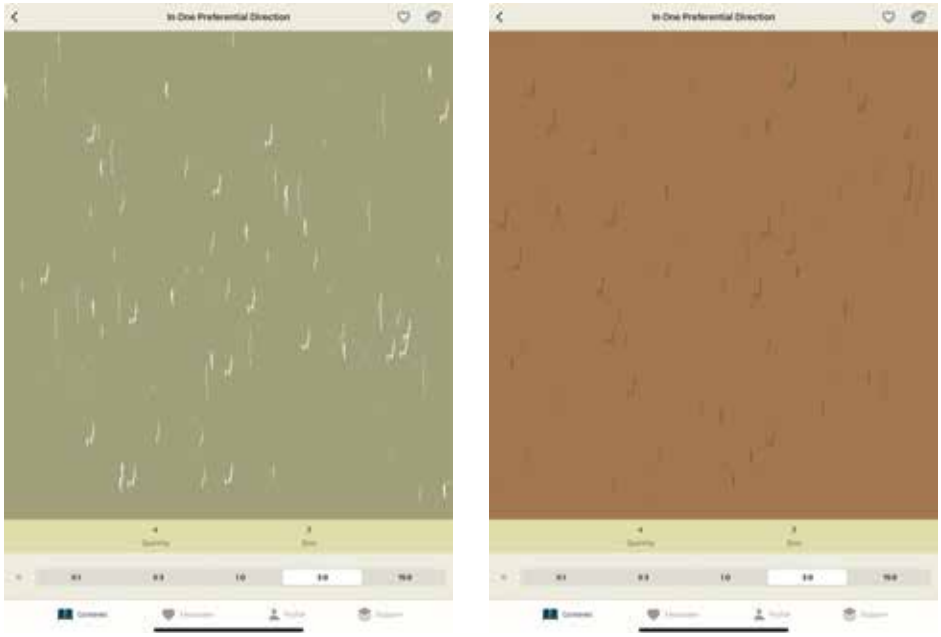
The degree of rusting and rusted area is tabulated as the degree of rust (Ri0 to Ri5) as an area percentage.

- Live videos of Rusting are included in the Coatings Radar App
- An overview of the ISO 4628-3 is also detailed.

ISO 4628 electronic replication in various colours

Cracking Tools

An interactive cracking visualisation for cracking without and with one preferential direction is detailed in the app. You can set the percentage and size of the cracking for both preferential directions and paint colours.



Various other colour options are available

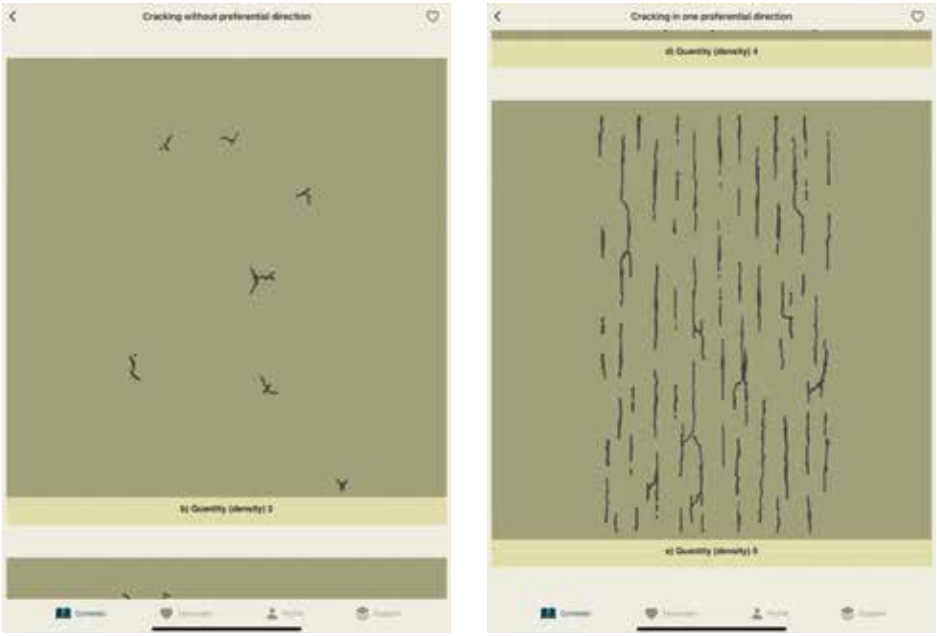
The Coatings Radar tabulates the rating scheme for designating the quantity of cracks as per ISO 4628-4, along with the rating and size of cracks. (0-5)

- Live videos of cracking are included in the Coatings Radar App
- An overview of the ISO 4628-4 is also detailed.

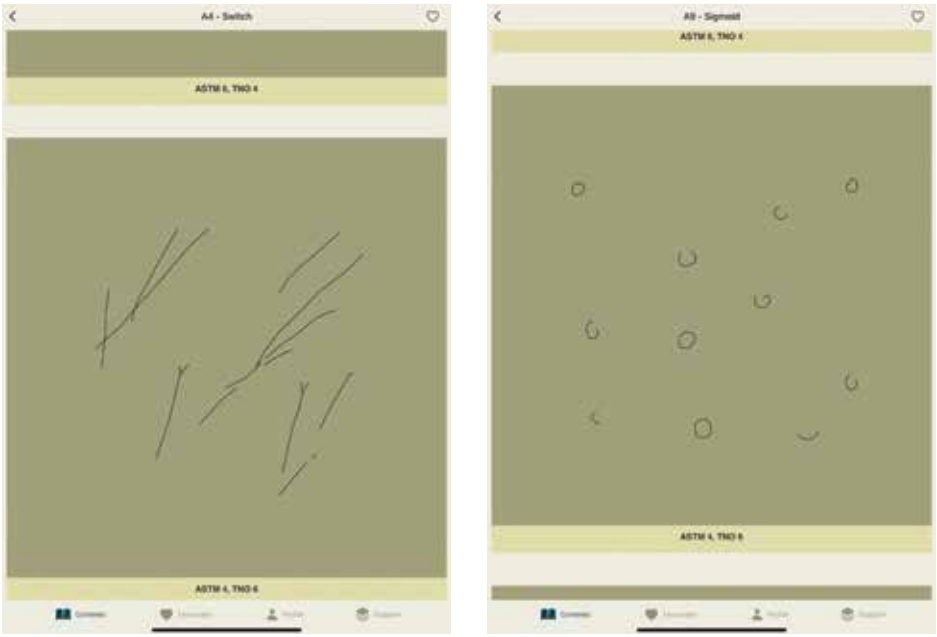
The Coatings Radar App can simulate a coated substrate with various degrees of rust or cracking. It is an interactive tool which allows colour changes and helps the coating surveyor to correctly assess the coating condition.

Cracking Tools (cont)

Cracking sizes



Cracking Sizes 2, 3 , 4 and 5 are included and include quantity and density – with and without one preferential direction.



Examples of the different types of cracking are included in the Coatings Radar App.
Irregular, Long Line, Short Parallel, Switch, Crow Foot, Mosaic, Shrinkage, Short, Random, Sigmoid

Flaking Tools

An interactive flaking visualisation for flaking without and with one preferential direction is detailed in the app. You can set the percentage and density of the flaking for both preferential directions and paint colours

Various other colour options are available

Quantity of flaking

The rating scheme for designating the quantity of flaking to ISO 4628-5 (0 to 5) and the percentage is tabulated in the Coatings Radar App. The size of the flaking and rating is also tabulated for ease of reading.

Examples of flaking without preferential direction and flaking in a preferential direction is included in the Coatings Radar App.

Also included:

- Live videos of cracking are included in the Coatings Radar App
- An overview of the ISO 4628-5 is also detailed.

Marine, Offshore and General Corrosion

The Coatings Radar App has an entire initiative section that the user can use to compare new and old structures on the extent of rust of a coated surface using the "European Scale of Degree of Rusting for Anticorrosive Paints," and ISO 4628-3 Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Assessment of degree of rusting.

The Coatings Radar App use the rust grades and applies them to various coated structures.

Marine

- Cargo Holds
- Cargo Tanks
- Cargo Oil Tanks
- Double Bottom Tanks
- Wing Tanks

Oil and Gas

- Oil and Gas Offshore Structures
- Oil and Gas Piperack
- Oil and Gas Pipes

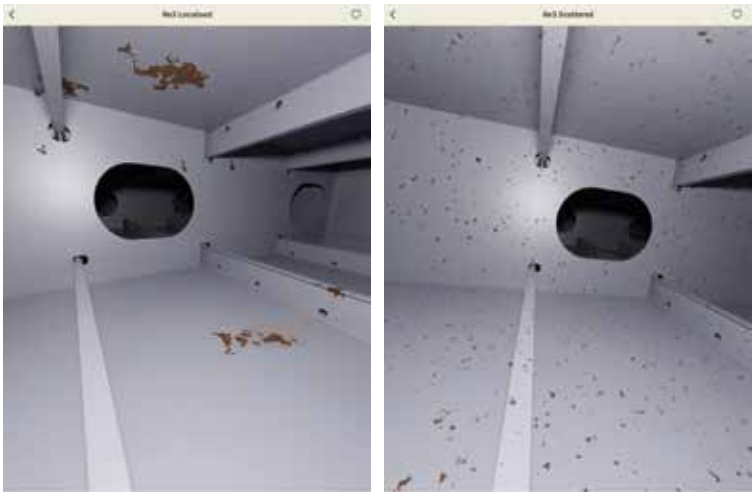
Wind Energy

- Offshore Wind Farms

Tank coatings can be viewed via a 360° gallery in the Coatings Radar App. The specific rust scale (Re) is activated before selecting localised or scattered rust.

Older tanks can also be selected for tanks that have been subject to salt water, such as double bottom tanks, where you will find rust staining from the specific rust locations.

Double Bottom Tanks – Re (no staining)



Double Bottom Tanks – Re (with staining)

Cargo Holds

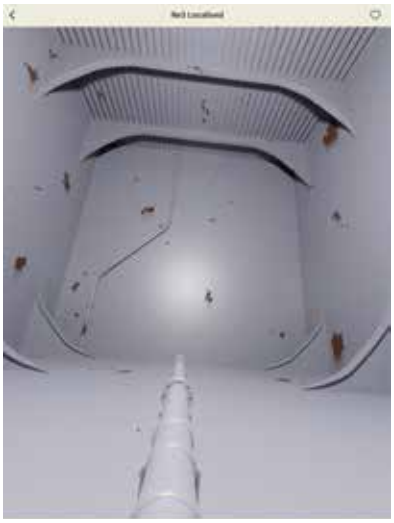
- Localised and Scattered corrosion spots.


Cargo Tanks

- Localised and Scattered corrosion spots.


Cargo Oil Tanks

- Localised and Scattered corrosion spots.




Wing Tanks

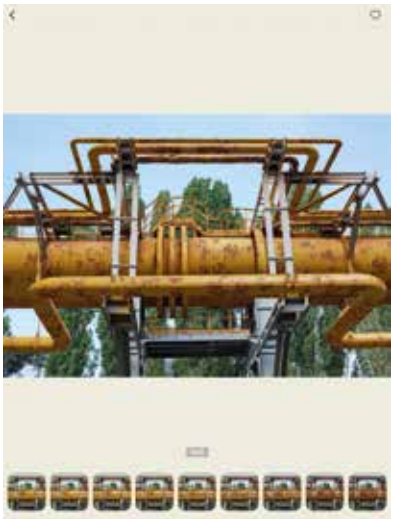
- Localised and Scattered corrosion spots

Oil and Gas

- Corrosion Assessment to Offshore Platform

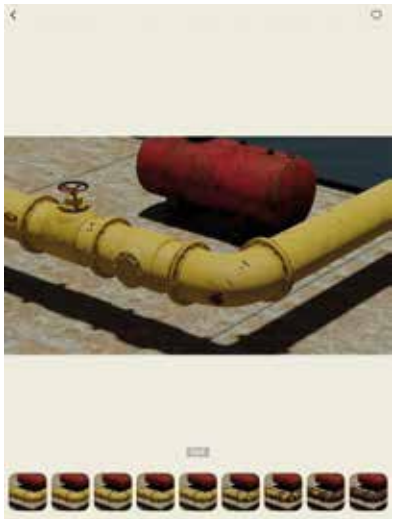
Oil and Gas Piperack

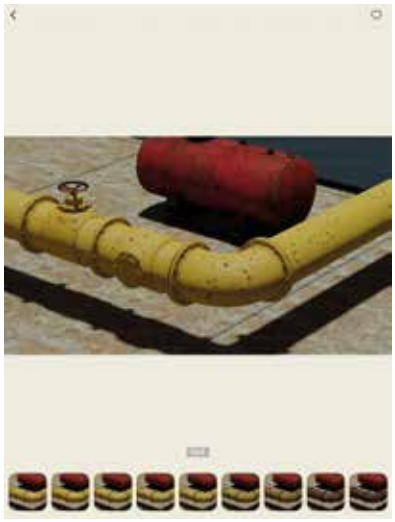
- Corrosion Assessment to Petrochemical Pipeline



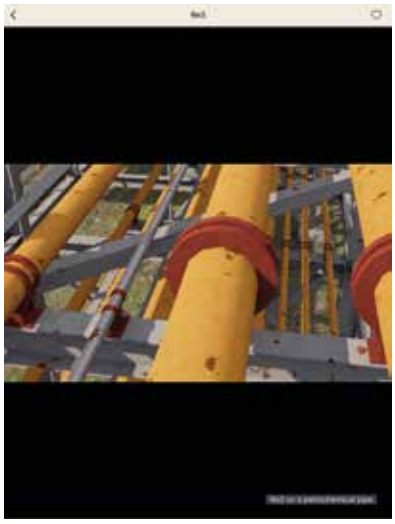
Oil and Gas Piperack

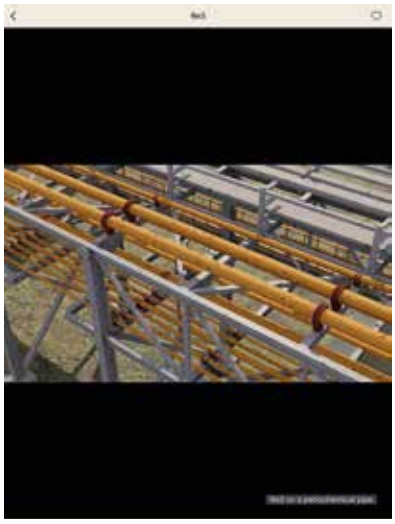
- Localised and Scattered corrosion spots





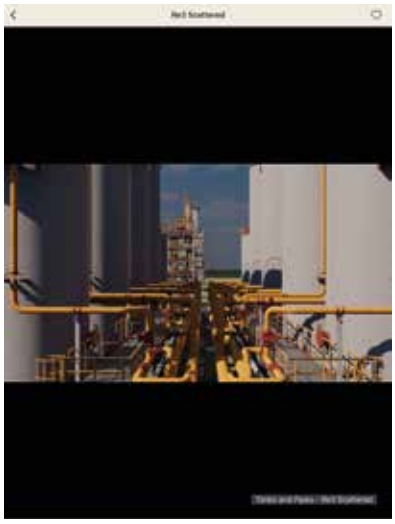
Piperack Videos (Flyby)





Tanks and Pipes

- Localised and Scattered corrosion spots.



Wind Energy (Gallery)

- Localised and Scattered corrosion spots.

Wind Energy (Videos)

- Localised and Scattered corrosion spots.

Industrial Tests

The Coating Radar offers the users comprehensive information on Coating Adhesion, Coating Surveys, Sampling and Coating Thickness.

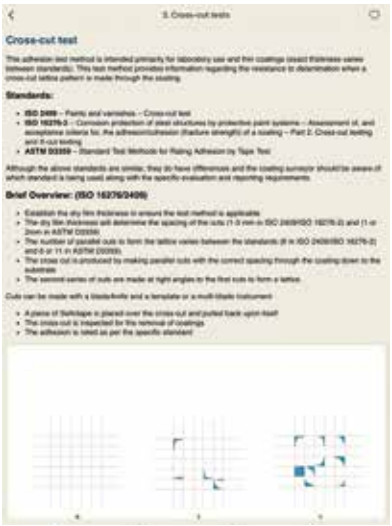
Adhesion

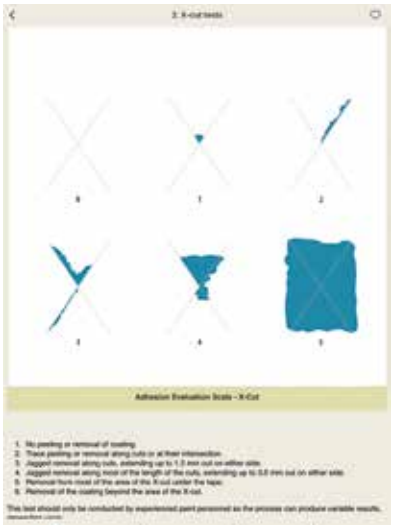
Adhesion of a coating refers to the bond strength between a coating and another coating or substrate. Adhesion testing will determine the bond strength and establish the likelihood of coating performance and suitability for overcoating.

The Coatings Radar App details all the adhesion tests on a coated surface, including X-Cut, Cross-Cut, and Pull-Off Tests.

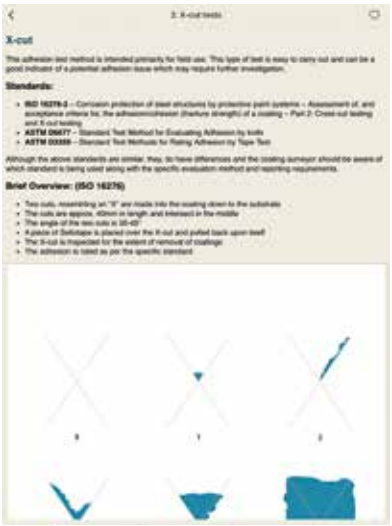
A full description and introduction to adhesion tests are included.

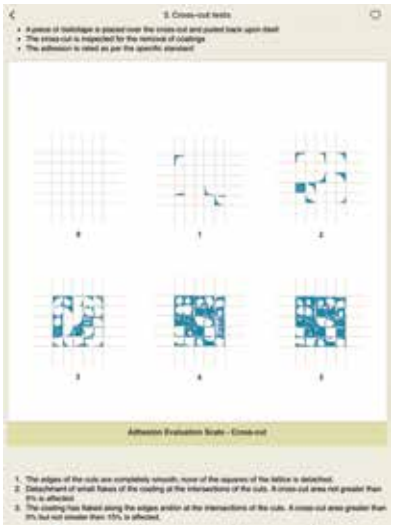
X-Cut



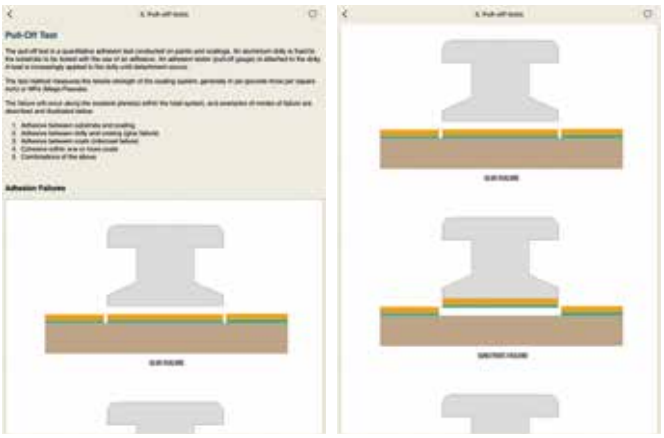


Cross-Cut



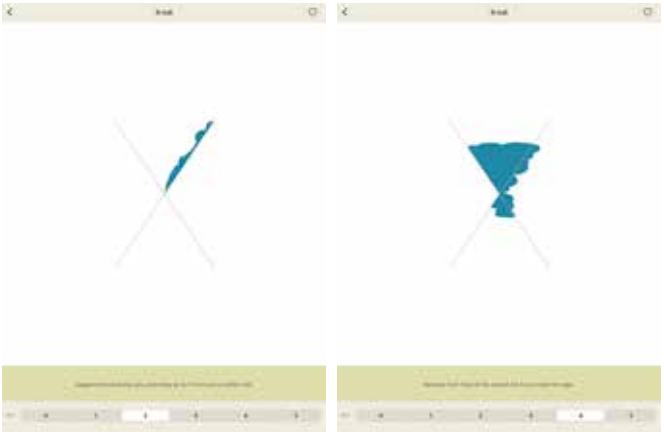


Pull-Off

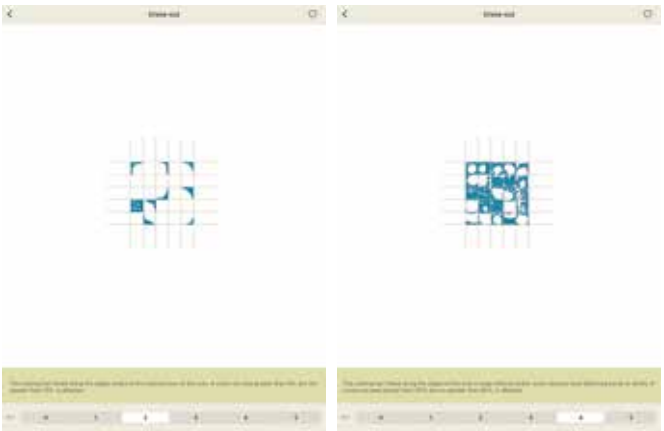


Adhesion Visualisations

X-Cut test in accordance with ISO 16276-2 is detailed in the Coatings Radar App. The user inputs the size from the sliding chart to illustrate the X-Cut test.



Cross-Cut in accordance with ISO 16276-2 and ISO 2409 is detailed in the Coatings Radar App. The user inputs the size from the sliding chart to illustrate the Cross-Cut test.



The Pull-Off adhesion modes (Glue failure, substrate failure and intercoat failure) are contained within the Coatings Radar App as an interactive demonstration.

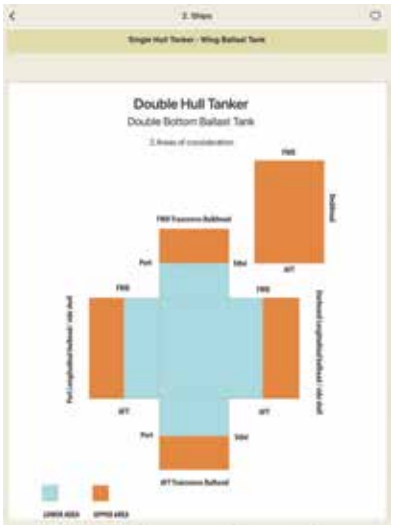
Pull-Off Cohesive failures are contained within the Coatings Radar App as an interactive demonstration.

Pull-Off combinations are included in the Coatings Radar App with Interactive examples of adhesion tests on multi-coat systems.

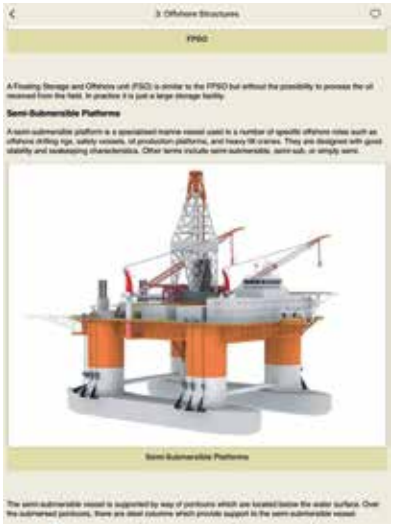
Coating Surveys

To ensure a protective coating is providing corrosion protection over the life of its future replacement, it is essential that consistent coating surveys are conducted which will determine the condition of the coating and suitability for maintenance or future work removal.

Ships



Offshore Structures



Petrochemical and Refineries

A description of petrochemical and refinery environments is contained on the Coatings Radar App, including typical techniques for Corrosion under insulation (CUI) and specific information a coating surveyor will need to conduct a coatings survey on a petrochemical plant.

Bridges (Infrastructure)

Detailed images and videos

The Coatings Radar App offers a comprehensive description of various industries including Ships, Offshore Structures, petrochemicals, refineries and bridges to assist the coating surveyor working in different industries.

Sampling

The collection of paint samples is an integral part of a coating survey or coating failure investigation. The correct sampling technique process must be conducted.

The Coatings Radar App includes a paint sampling introduction, paint flakes, detachment, blistering sampling and a list of suitable equipment requirements for paint sampling.

A full introduction to paint sampling is detailed.

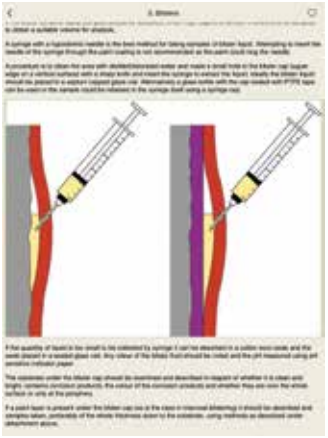
Paint Flakes

Details of how to collect paint samples

Detachment

Delamination

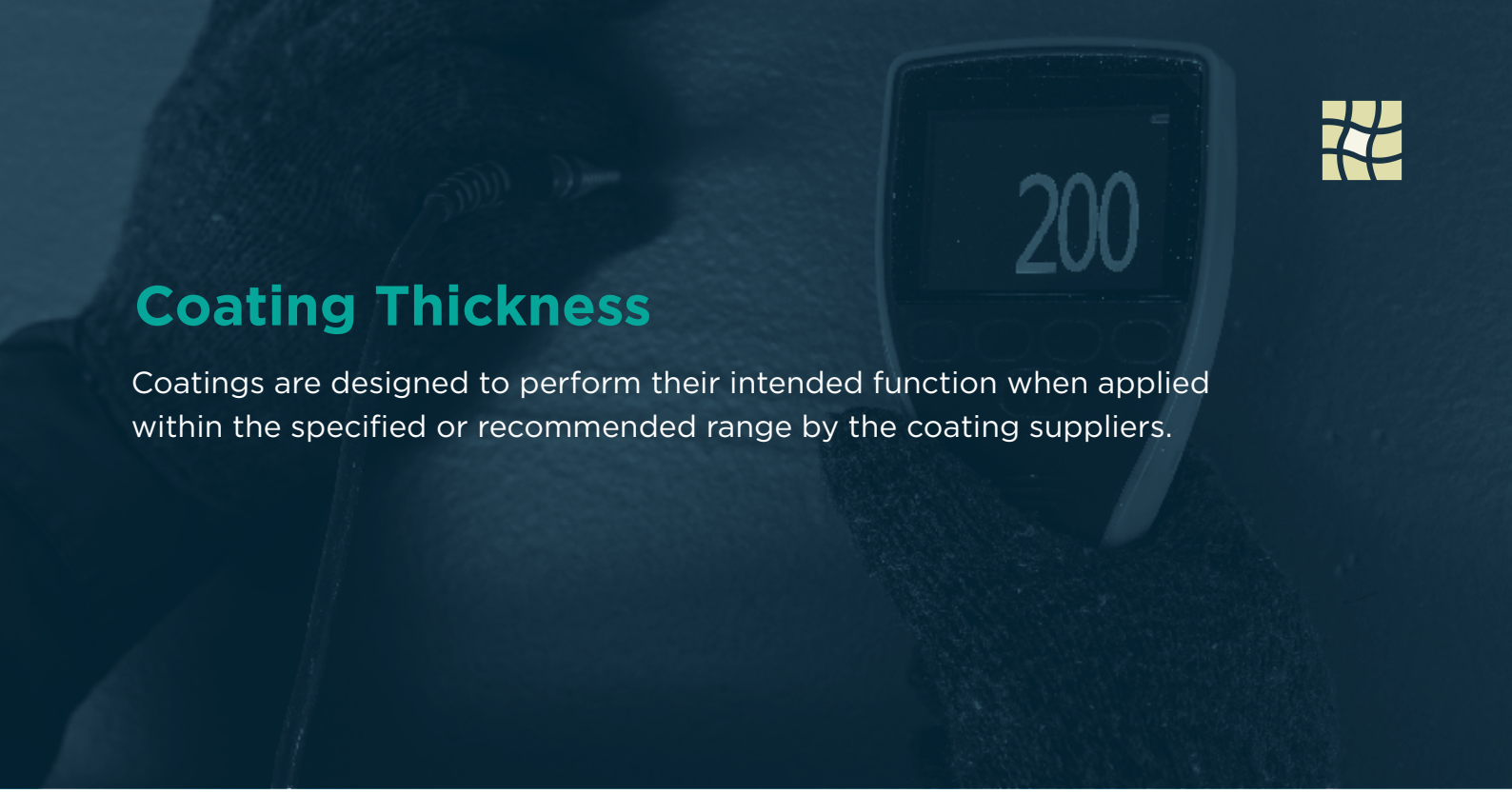
Blisters



A detailed description of sample containers is included in the Coatings Radar App and includes cargo samples, control samples, labelling and chain of custody

Equipment

A full list of coating surveyors' equipment is included with an illustration of each item.



Coating Thickness

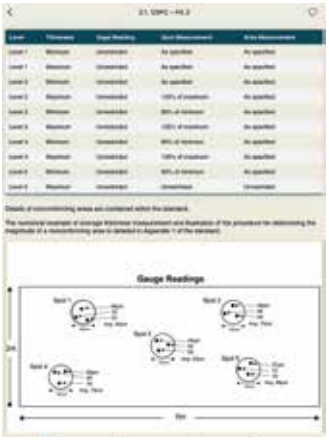
Coatings are designed to perform their intended function when applied within the specified or recommended range by the coating suppliers.

This section of the coatings Radar App has a comprehensive review of the dry film thickness:

- Introduction to dry film thickness and implications on coating performance

- Dry Film Thickness Gauges. Types of dry film thickness used

- SSPC – PA2 (initial Overview)



- Dry Film Thickness Standards

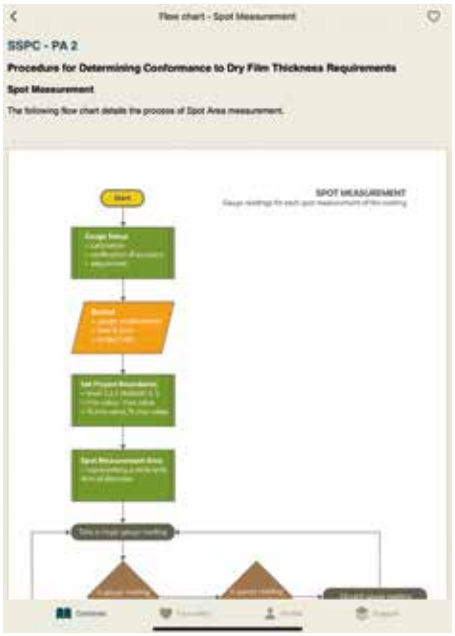
Details of various standards relating to dry film thickness measurements

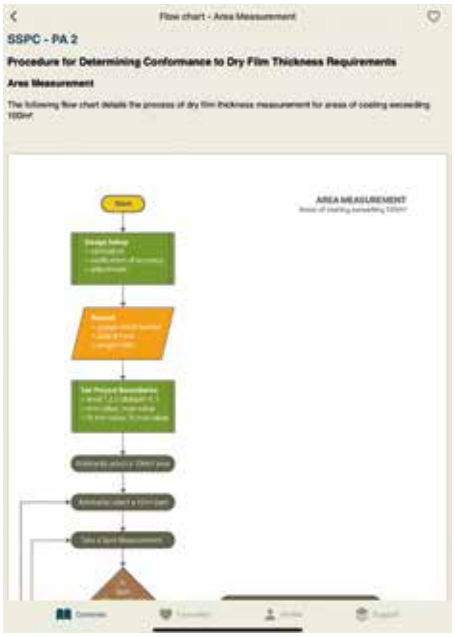
1. ASTM – D7091
2. ISO 19840
3. IMO PSPC
4. ISO 2808

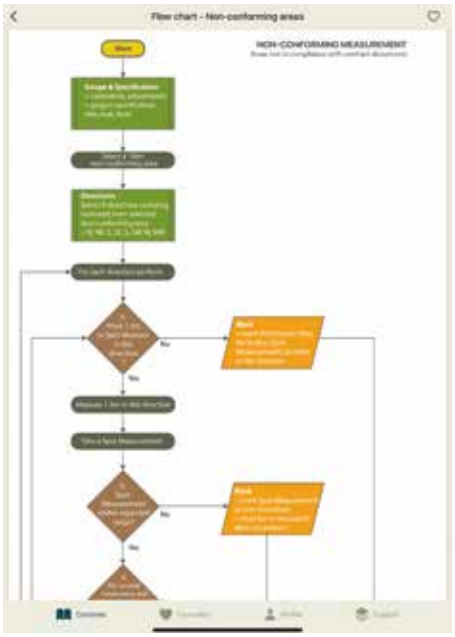
SSPC - PA2 Interactive Tools

The Coatings Radar App has a comprehensive interactive tool for using the SSPC-PA2

Flow Chart Spot and Area Measurement

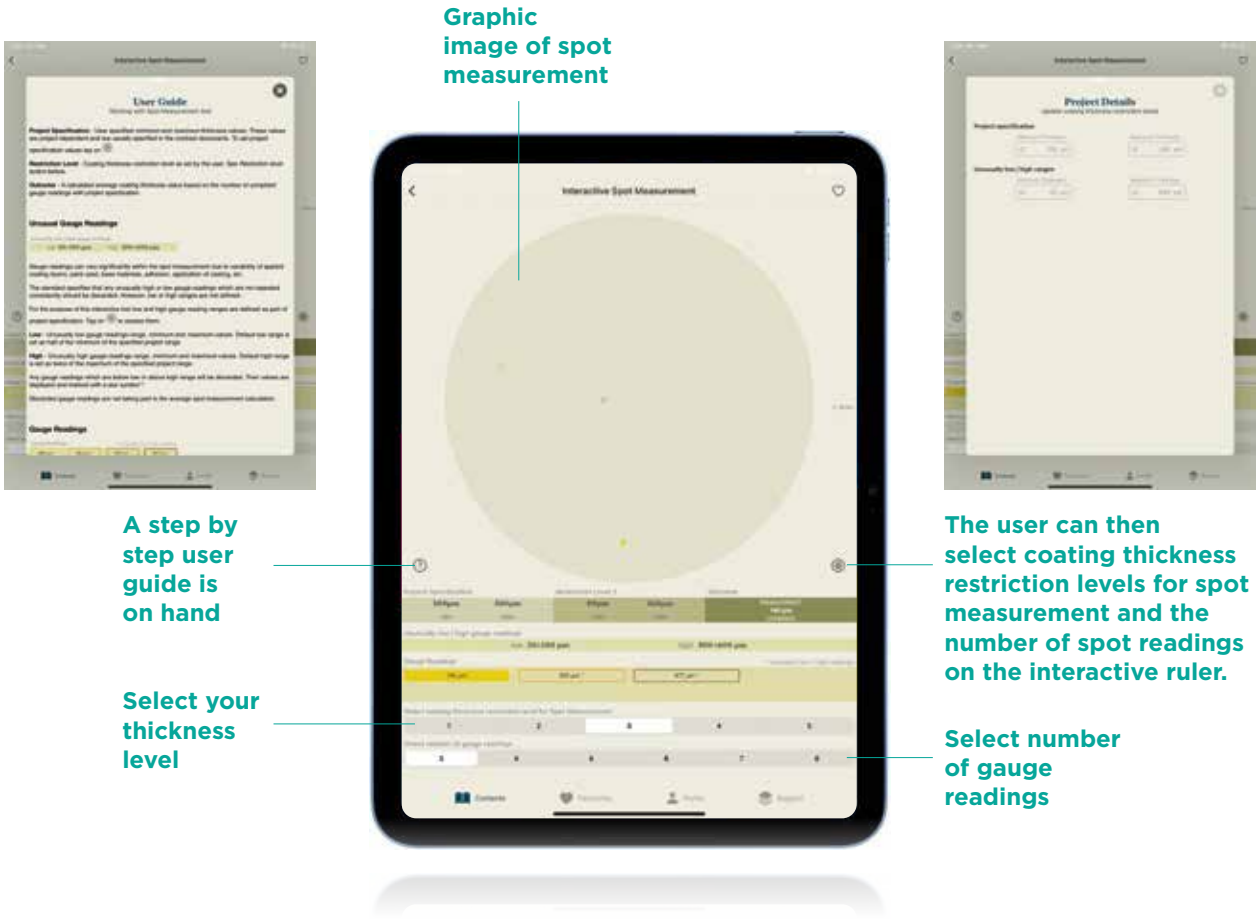






Interactive Spot Measurement

The Coatings Radar App allows the user to set up the project dry film thickness requirements using the project specifications and unusually low/high ranges and input the spot measurements.



Interactive area mesurement tool also included

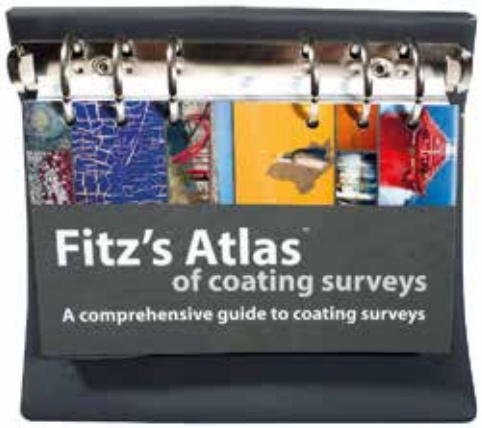
The Coatings Radar App with the interactive tool allows the user to simulate real life project scenarios where the SSPC-PA2 can be used.

Manuals and Standards

The Coatings Radar App has several materials and Standards documents to assist with conducting a coating survey.

Fitz's Atlas of Coating Surveys

A full electronic version of Fitz's Atlas of Coating Surveys book is included in the Coatings Radar App.



Contents

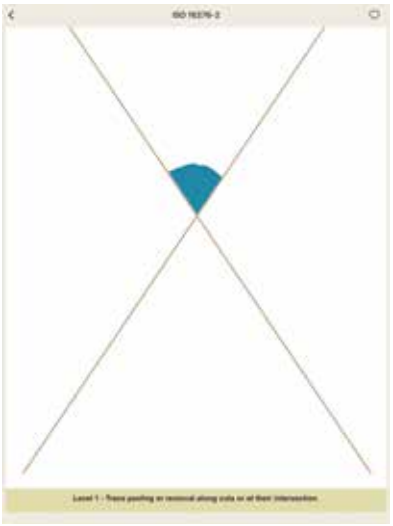
Paint Testing

Paint testing should be conducted with International Standards; this will ensure a consistent method of evaluation and should minimise any misintpretation of the findings.

This section details a number of SSPC, ASTM and ISO Standards used for Paint Testing on Coatings Surveys.

Adhesion Testing

Paint adhesion should be conducted with International Standards; this will ensure a consistent method of evaluation and should minimise any misinterpretation of the findings.



Dry Film Thickness

Dry Film Thickness should be conducted with International Standards; this will ensure a consistent method of evaluation and should minimise any misinterpretation of the findings.

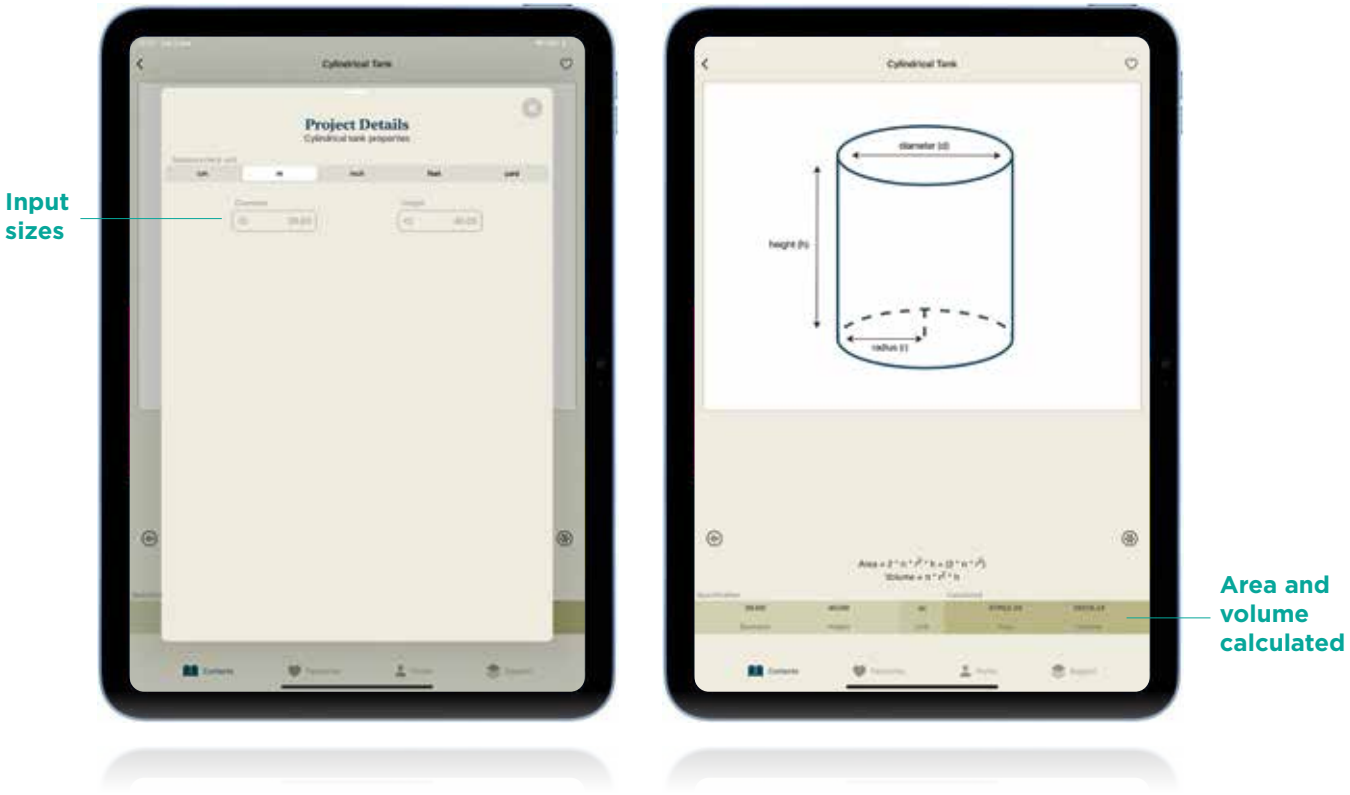
Holiday Detection

Holiday Detection should be conducted with International Standards; this will ensure a consistent method of evaluation and should minimise any misinterpretation of the findings.

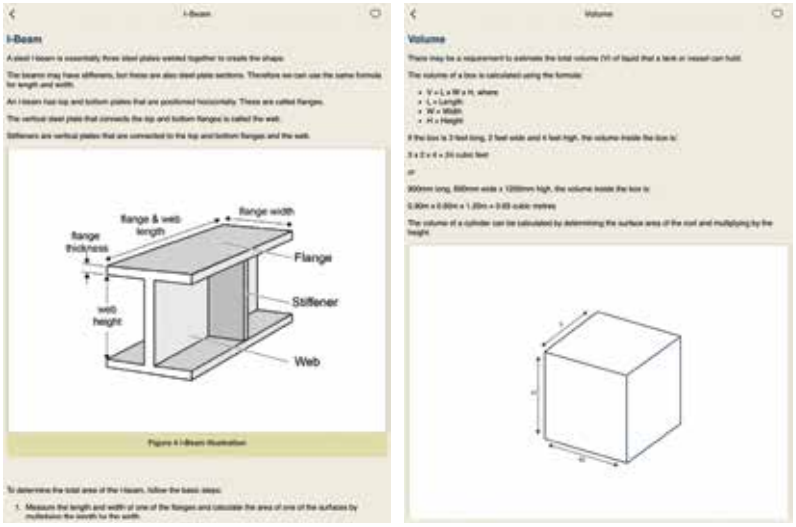
Surface Calculations

Calculating paint consumption correctly can be extremely important, especially in certain locations, such as shipboard maintenance or offshore structures, where additional deliveries can be a problem.

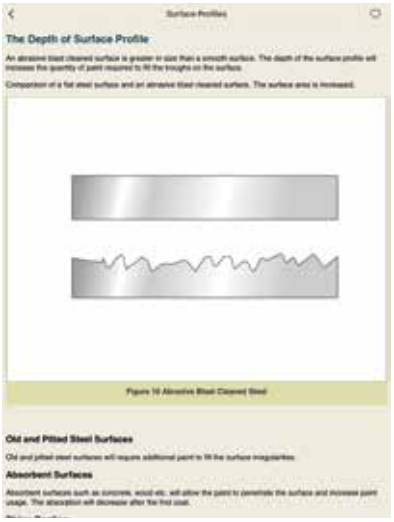
Interactive Calculators



Calculating Areas

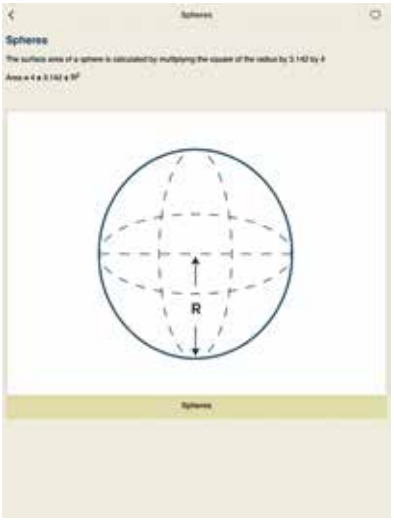


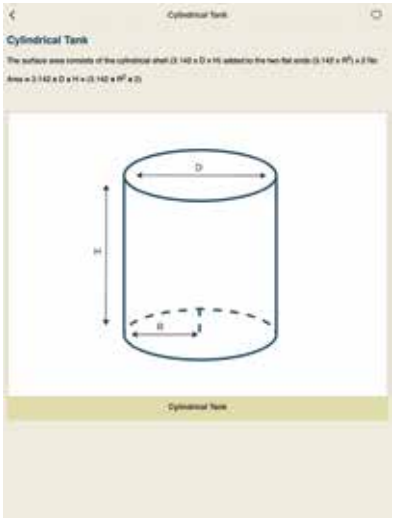
Paint Arithmetic



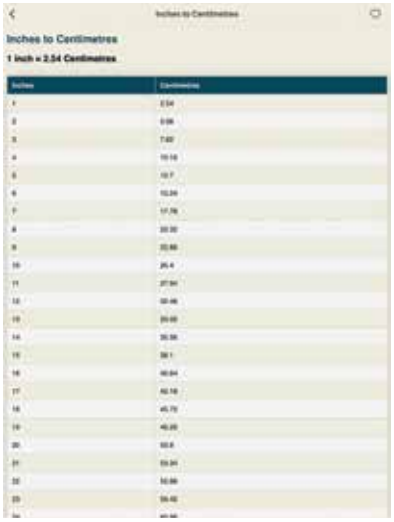
Conversions

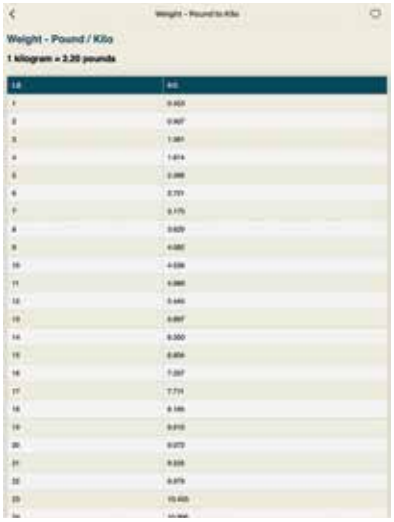
Surface Area Formulas





Conversion Tables





Surface Assessment

It is common to come across different types of corrosion on a coated surface, which must be accurately documented in the coating survey report.

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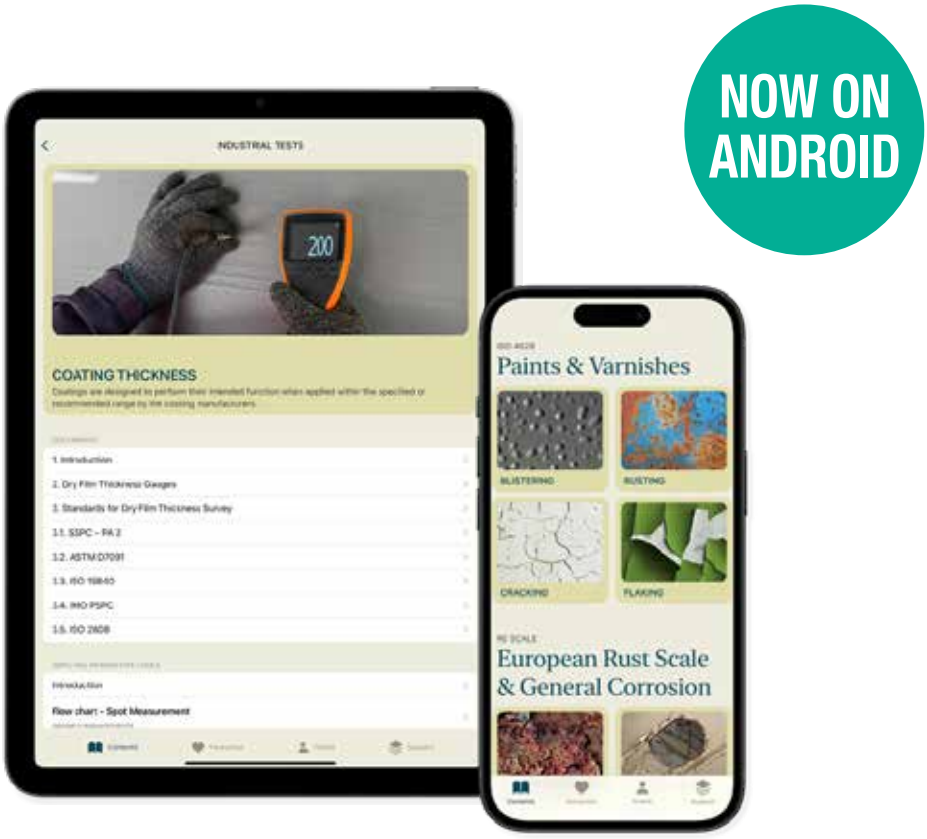
How To Get The App



Getting the Coatings Radar App is straightforward, simply go to the Apple App or Google Play store and search for Coatings Radar.

The Coatings Radar App can be used on an iPhone, iPad or iMac and now new for 2025 Android devices as well.

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