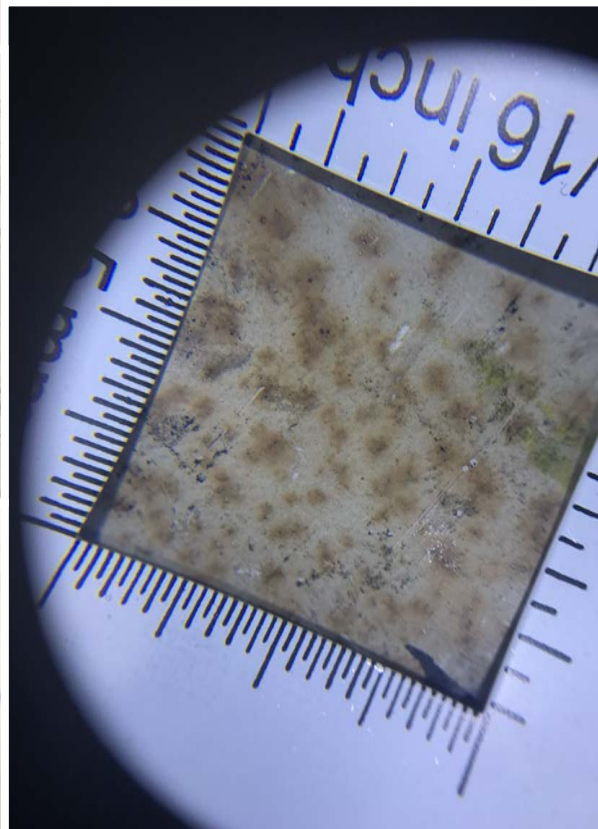


# COATINGS INSPECTION AND TESTING



**WE KNOW POLYMERS - WE KNOW TESTING**

## Coatings Inspection & Testing

ExcelPlas conducts coating condition assessment and testing for major clients in the oil & gas sector. It provides conventional and advanced non-destructive testing services, as well as destructive & chemical testing on a range of protective coatings.

ExcelPlas has qualified coatings specialists supported by materials and corrosion analysts to inspect, analyse and assess protective coatings.

We offer:

- specification and selection of protective coatings
- accelerated weathering, salt spray and humidity testing and screening of candidate coatings
- coating inspections including hardness, DFT thickness, X-cut adhesion, pull-off adhesion, holiday testing, wet-sponge testing, surface roughness, etc.
- investigation and analysis of coating failures (root cause)
- coating repair strategy and approach (i.e. type of surface prep, selection and screening of reinstatement coatings)

## Coatings Testing

ExcelPlas provides protective coating analysis services and various laboratory testing on protective coatings. The combination of our experienced coatings chemists together with our material scientists ensures that the client receives the best test regime in accordance with various international Standards. ExcelPlas is accredited in accordance with ISO 17025 in some of the laboratory-based coating related tests.

ExcelPlas can provide following types of inspections and laboratory based tests on coating

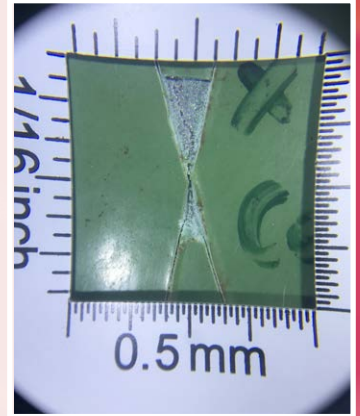
- Blast surface inspection – blast profile measurements using Testex method
- Precoating surface inspection for soluble salts contamination.
- Dry Film Thickness (DFT)
- Degree of cure testing (DoC)
- Coating Adhesion test (coating Pull-off testing, POT)
- Film continuity test (Low Voltage Wet Sponge)
- Holiday (high-voltage porosity) coating continuity test
- Coating qualification testing
- Cathodic Disbondment (CD) test
- Failure investigation on coatings
- Third Party Inspection and witnessing of coating activities

## EIS Testing

EIS is a technique well suited for evaluating the permeability or barrier properties of protective coatings based on the electrical resistance of the coating. The impedance of a coating is related to the nature of the polymer, its density, and its fillers.

The impedance of a coating is observed to decrease as a function of time of exposure in the service environment.

The decrease in impedance is observed to be related to the formation of microcracks, fissures, galleries, loss of barrier properties and the onset of under-film corrosion. As protective coatings such as epoxies and epoxy-phenolics age they become more permeable to ions, water, gases, and other corrosive species of the service environment. EIS thus tracks the barrier properties of the coating and can give information on the state of the coating and its expected service life.



## Polymer Problem Solving





# 25+

Years in Operation

# 15+

Qualified Staff

# 500+

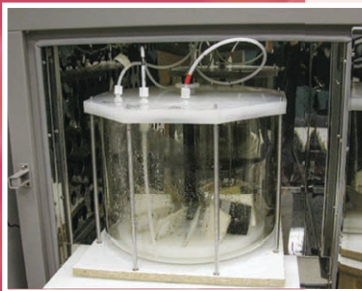
Return Customers

# 1000+

Failure Analyses

# 8000+

Laboratory Jobs



## Coating Microstructural Analysis

ExcelPlas can undertake microstructural examination of protective coatings to determine their quality and integrity. The microstructural examination involves evaluating coating thickness and number of layers, identifying filler/pigment size and distribution, pigment agglomerates, oxide clusters, microcracks, identifying and quantifying of voids or porosity, foreign particles, interface appearance, delaminations, corrosion cells etc. ExcelPlas routinely performs microstructural examination of protective coatings frequently for its clients in the oil & gas, mining, pipelines and offshore sector.

## Protective Coating Inspection Services for:

Mining industry infrastructure (Tanks and Pipes)  
Oil and Gas industry infrastructure  
Offshore structures FPSO  
Above & Below Ground Gas and Oil Transmission  
Pipelines, Process Piping, Storage tanks  
Water & Waste Water Treatment Plants  
Aviation and Airport facilities (Fire Fighting Foam Storage Tanks)

## Pipeline Coating Types:

- Liquid applied epoxy (LAE) coatings
- Fusion bonded epoxy (FBE) powder coatings
- Polymeric tape coatings
- Bituminous tape coatings
- Petrolatum and wax tape coatings
- Heat shrinkable coatings
- Elastomeric coatings
- Automobile coatings (epoxies)
- Coil coatings (polyester)
- Construction coatings (epoxies, polyurethanes)
- Fluorocarbon coatings (PVDF)
- Plastic coatings
- Powder coatings
- Rubber paint

Founded in 1994, ExcelPlas conducts coating condition assessment and testing for major clients in the oil & gas sector. It provides conventional and advanced non-destructive testing services, as well as destructive & chemical testing.

## Coatings Problem Solving

Protective Coatings are an essential component billion-dollar fight against corrosion and damage of steel plant, equipment, vessels and pipelines.

ExcelPlas can assist clients and asset owners to address coating problems and questions such as:

- Has the protective coating been correctly specified and applied?
- What level of surface preparation and atmospheric conditions are required to ensure the coating performs properly in service?
- Why is the coating not acting as a corrosion barrier?
- Why is the coating swelling, blistering and/or delaminating?
- Does the coating meet the product/project specifications for correct thickness, correct hardness, adequate degree of cure and adequate adhesion?
- Does the coating have any defects in it such as pigment agglomerates, voids, air bubbles, inclusions? How will these defects affect performance?
- By what mechanism did the coating fail?
- How can the failed coating be remediated/replaced so that it doesn't fail again?



### Epoxy Mix Ratio Testing

Epoxy-based coatings can fail if incorrect ratios of the base epoxy and amine hardener that form the epoxy coatings are used. ExcelPlas conducts nitrogen analysis testing to confirm the mix ratios of in service epoxy coatings.

ExcelPlas provide coating analysis and examination to the following relevant AS, AS/NZS, ASTM and ISO standard:

- AS 1580.400 Paints and Related Materials – Methods of test - Cured Coatings – Performance by mechanical testing;
- AS 1627.9 Pictorial surface preparation for painting steel surfaces;
- AS 2312.1 Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Paint Coatings;
- AS 3894 – Site testing of Protective Coatings;
- AS 3894.1- Site testing of protective coatings - Non-conductive coatings - Continuity testing - High voltage ('brush') method; or
- AS 3894.2- Site testing of protective coatings - Non-conductive coatings - Continuity testing - Wet sponge method.

### Major Clients

ExcelPlas undertaken consulting and testing work with, for and on behalf of the following major companies with regard to protective epoxy coatings for steel structures and pipelines:

- INPEX Ichthys Project (Darwin)
- INPEX (Offshore)
- Chevron (Darwin & Offshore)
- Chevron (Wheatstone Project)
- Saipem
- Samsung Heavy Industries (SHI, South Korea)
- Daewoo Shipbuilding & Marine Engineering (DSME, South Korea)

### Other Coatings Tests

- ASTM D153 SPECIFIC GRAVITY OF PIGMENTS
- ASTM D185 COARSE PARTICLE SIZE-PIGMENTS, PASTES, PAINTS
- ASTM D522 MANDREL BEND
- ASTM D659 EVALUATING DEGREE OF CHALKING
- ASTM D660 EVALUATING DEGREE OF CHECKING
- ASTM D661 EVALUATING DEGREE OF CRACKING
- ASTM D662 EVALUATING DEGREE OF EROSION
- ASTM D714 EVALUATING DEGREE OF BLISTERING OF PAINTS
- ASTM D772 EVALUATING DEGREE OF FLAKING
- ASTM D869 EVALUATING DEGREE OF SETTING OF PAINT
- ASTM D870 TESTING OF WATER RESISTANCE\WATER IMMERSION
- ASTM D1005 MEASUREMENT OF DRY FILM THICKNESS
- ASTM D1186 FILM THICKNESS OF NONMAGNETIC COATING
- ASTM D2370 TENSILE PROPERTIES OF ORGANIC COATINGS
- ASTM D2454 DETERMINING EFFECT OF OVERBAKE ON COATINGS
- ASTM D2485 EVALUATING TEMPERATURE RESISTANT COATINGS
- ASTM D2698 DETERMINATION OF PIGMENT\CENTRIFUGE
- ASTM D3168 QUALITATIVE IDENTIFICATION OF POLYMERS/FTIR
- ASTM D3359 MEASURING ADHESION BY TAPE TEST
- ASTM D3363 FILM HARDNESS BY PENCIL TEST
- ASTM D4060 TABER ABRASION
- ASTM D4138 MEASUREMENT OF DRY FILM THICKNESS BY SEM
- ASTM D4139 VOLATILE & NONVOLATILE CONTENT OF PIGMENTS
- ASTM D4214 DEGREE OF CHALKING OF EXTERIOR PAINTS
- ASTM D4451 PIGMENT CONTENT BY LOW TEMPERATURE ASHING
- ASTM D4563 TIO2 CONTENT BY AAS

**contact: [www.excelplas.com](http://www.excelplas.com)**



**WE KNOW POLYMERS - WE KNOW TESTING**