Intercure 4500
Application Guidelines

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The International Paint Application Guidelines have been produced and revised in line with the Worldwide Protective Coatings Product Range. The purpose of the guidelines is to ensure that the product, as applied, provides the required level of durability.

Successful in-service performance of a coating system depends upon both the correct choice of product(s) and the adoption of the correct guidelines for surface preparation and paint application.

The responsibilities for achieving the specific standards outlined, and for carrying out surface preparation and paint application, rest with the Contracting Company. Under no circumstances do these responsibilities rest with International Paint. We will generally provide for the presence of a Technical Service Representative at key stages during the performance of the contract. The role of the International Paint Technical Service Representative is advisory only unless otherwise specified in the terms and conditions of the contract. The information contained herein presents guidelines for the application of Intercure 4500 to correctly prepared surfaces.

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1. INTRODUCTION

Intercure 4500 is a novel, high performance coating that is primarily intended as a single coat semi-gloss primer/finish to provide both anticorrosion and barrier protection in direct-to-metal applications in moderate environments (ISO 12944 C3 or less). It is capable of providing corrosion protection to steel as soon as it is hard dry and may be stacked with care after the product is hard dry (please see the product data sheet).

This document gives additional guidance on the use and application of Intercure 4500 and should be read in conjunction with the Intercure 4500 Technical Datasheet and Material Safety Datasheet (MSDS).

2. WHERE TO APPLY INTERCURE 4500

Intercure 4500 is suitable for application in the steel fabrication shop or at an applicators' works, provided sufficient time is given for hard dry properties to be achieved. At this point the system can be readily handled but care should be taken during transportation and erection to minimise mechanical damage. It rapidly hardens in the first 24 hours yet remains flexible, thus affording good damage and impact resistance.

Applied direct to metal, as a one coat system, Intercure 4500 is effective in moderately corrosive environments up to ISO12944 C3, offering early water resistance. In the higher corrosivity environments of ISO12944-2 C4/C5, Intercure 4500 should always be applied over an approved primer.

3. STORAGE OF MATERIAL

Due to its moisture sensitive nature, Intercure 4500 should always be stored in covered dry conditions. If the outside of the tin becomes wet it should be thoroughly dried before opening to ensure no moisture contamination occurs. Ideal storage temperature ranges from 5ºC- 40ºC (41ºF-104ºF).

At lower temperatures the base component will become more viscous and may require warming or thinning prior to application. At higher temperatures, materials will flow more easily and dry faster. It should be noted that there will be potlife variations depending on the temperature.

4. ENVIRONMENTAL CONDITIONS FOR APPLICATION

Intercure 4500 is moisture sensitive and both the rate of drying and potlife can be affected therefore environmental monitoring is important. The following parameters apply:

Application should be conducted under cover from the elements and Intercure 4500 should not be exposed to external weather conditions until hard dry properties have been achieved. Ideal application temperature is between 15ºC and 25ºC (59ºF and 77ºF), however, Intercure 4500 is capable of curing at application temperatures down to 5°C (41°F).

The surface onto which Intercure 4500 is to be applied must be clean, dry and free from contaminants. Steel temperatures must always be 3ºC (5ºF) above the dew point.

Relative humidity (RH) during application and curing should ideally be between 40% and 80%, with a maximum 85%. The higher the humidity, the faster the rate of cure. However, gloss reduction may accompany higher levels of humidity, especially where RH exceeds 85%.

Care should be taken where the relative humidity at the time of application is below 40%). Please consult International Protective Coatings if required. Rate of cure (touch/hard dry times) will be affected at low relative humidity.

Moisture contamination in the mixed product may result in a significant reduction in potlife. Temperatures above 40ºC (104ºF) will also impact on potlife although 45 minutes is typical under these conditions. Conversely, low temperatures (below 10ºC (50ºF)) may extend potlife and will also retard the drying process.

Ambient conditions should be measured at regular intervals, particularly if conditions are changeable.

5. SURFACE PREPARATION

In common with most protective coatings schemes, the performance level of Intercure 4500 is ultimately determined by degree of surface preparation. The higher the degree of surface preparation achieved, the greater the long-term performance.

For optimum performance, all surfaces to be coated should be clean, dry and free from contamination including dirt, salts, oil and grease. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000. Where necessary, remove weld spatter and smooth weld seams and sharp edges.

Abrasive Blast Cleaning

All steel surfaces to be coated should be correctly prepared prior to application of the coating system. The preferred method of preparation is abrasive blast cleaning to Sa2½ (ISO 8501-1:2007) or SSPC-SP6.

A minimum, angular surface profile of 50 microns (2 mils) is recommended.

Weld seams and damaged areas should be blast cleaned to Sa2½ (ISO 8501-1:2007) or SSPC SP6, where this is not practical prepare to a minimum of SSPC SP11, ensuring that the steel doesn't become 'polished'; a minimum surface profile of 50µm (2 mils) is required.

Primed Surfaces

Primers should be clean and free of dirt, grease, oil, zinc salts or other deleterious matter. If the primer has exceeded its maximum overcoating interval, then abrasion may be necessary to provide a surface that will accept the Intercure 4500.

6. PRIMERS AND OVERCOAT INTERVALS

Intercure 4500 has been designed to provide rapid cure handling properties and as a result, not all primer coats are compatible in terms of cure properties and intercoat adhesion. The following primers are currently approved for use in conjunction with Intercure 4500 in onshore C4 and C5 corrosive environments.

Intercure 200HS	C4
Interzinc 52	C4 and C5 (curing agents EPA176 and EPA180)

Over-application of the primer coat will extend the minimum overcoating time as published on the relevant primer datasheet.

7. MIXING

This product is supplied in two components, a pigmented base (Part A) and curing agent (Part B). Both tins should be kept dry until used. On opening the base, it should be slowly mixed with a pallet knife (or similar implement) to reincorporate any liquid that may have separated out to the surface. The sides and bottom of the container should be scraped to ensure all settlement and residue is recombined. It should then be mixed with a mechanical agitator (air-powered equipment) for a few minutes to ensure full incorporation.

The curing agent should then be added to the base in its entirety and the combination power mixed with a mechanical agitator for several minutes until a uniform paint is obtained. For tinted colours, a 5-minute induction time is recommended to fully develop colour. Failure to allow induction, particularly at low temperatures, may result in inconsistency of the finished shade.

The quantities of base and curing agent supplied in the packs are such that the combination should not exceed the lip of the larger tin. There will also be room for partial thinning with International GTA713 (or GTA056) only, although this would not normally be required. The use of alternative thinners, particularly those containing alcohols, can severely affect the curing mechanism and/or workable pot life of the coating and should not be used

Note: Intercure 4500 reacts with atmospheric moisture and will form a layer of skin on the surface if left exposed for a prolonged period. Once the containers have been opened, it is recommended that the material be mixed and used as soon as possible. If a skin does form it should be scraped to one side and not re-incorporated into the paint. A thin layer of solvent added to the surface of the paint on commencing will prevent excessive skinning. International GTA713 or GTA056 should be used for this.

The importance of thorough and correct mixing cannot be over-emphasised and is essential in order to ensure the precise performance of the coating.

Do not mix more material than can be used within the pot-life of the material.

8. POT LIFE

With Intercure 4500, no significant increase in viscosity is observed after mixing, even after long periods. However, if the stated pot life is exceeded then the final coating film may have inferior properties and will not give the specified level of performance. Pot life times on the technical datasheet refer to 50% relative humidity:

Intercure 4500 must not be applied after the stated potlife has been exceeded.

Temperature	Potlife
5ºC (41ºF)	3 hours
15ºC (59ºF)	2 hours
25ºC (77ºF)	1 hour
40ºC (104ºF)	45 mins

Note: Relative humidity as well as temperature can affect the pot life. Generally, the higher the humidity, the shorter the pot life; for example, at 10ºC (50ºF) and 80% humidity, the pot life will be 2 hours, compared with 2¼ hours at 50% humidity. Measurements should be made before and during application as to the exact environmental conditions.

9. AIRLESS SPRAY APPLICATION

Airless spray is one of the methods of application recommended to give the optimum cosmetic appearance of Intercure 4500. At higher film thicknesses than recommended will result in a higher gloss appearance. See section 11.0 for more details.

The airless spray equipment should be in good working order. Pump ratios of 32:1 up to 60:1 can be used or any pump capable of producing a minimum output pressure of 176kg/cm^2 (2,503 psi), lines should have an internal diameter of 9.5mm (3/8"). Tip size can be from a minimum of 0.38mm (15 thou) up to 0.48mm (19 thou), depending on application requirements.

Tip angles will depend on the profile and area of the steelwork to be sprayed but are preferable to be low, i.e., less than 50º, to assist better wet film formation and reduced potential overspray.

Airless gun type used should be rated above the maximum working tip pressure anticipated.

It is recommended to flush out all application equipment with International GTA713 or GTA056 thinner prior to application to ensure that there is no contamination and/or moisture in the lines. All equipment should be cleaned immediately after use. It should be noted that Intercure 4500 is moisture curing therefore it is good working practice to periodically flush out spray equipment during the course of the working day.

Note: Intercure 4500 is designed to be applied between 150-200 microns dft (6-8 mils) in one spray coating without the need for thinning via air spray and airless spray techniques. This equates to approx. 195-260 microns (7.8-10.4 mils) wet film thickness. This product must only be thinned using the recommended International thinners, GTA713 or GTA056. The use of alternative thinners can severely affect the curing mechanism and/or workable pot life of the coating.

10. AIR SPRAY APPLICATION

Conventional air spray with attached pressure pot is best achieved when using a De Vilbiss MBC or JGA gun or an equivalent design with a 704 or 765 air cap and an E fluid tip with a minimum of 1.4mm (55 thou ") diameter and up to a 1.8mm (70 thou ") diameter. A moisture and oil trap in the main air supply line is essential.

A 12.5mm (½ inch) internal diameter paint line is recommended with all in-line filters removed. The pot pressure should be kept as low as is possible. When starting to apply, keep the fluid tip fully open at the commencement and adjust until optimum settings are obtained.

Typical pressures:

Atomising Pressure	40-50 p.s.i. (2.8-3.5Kg/cm^2)
Pot Pressure	10-20 p.s.i. (0.7-1.4Kg/cm^2)

Note: Intercure 4500 is designed to be applied between 150-200 microns dft (6-8 mils) in one spray coating without the need for thinning via air spray and airless spray techniques. This equates to approx. 195-260 microns (7.8-10.4 mils) wet film thickness.

11. BRUSH AND ROLLER APPLICATION

Brush and roller are suitable methods of application for Intercure 4500 although the standard of cosmetic appearance may be reduced. They are best used on small areas or stripe coating, where minimal overlap to other areas is required and where local site access prevents spray application. When using a brush/roller technique it may be necessary to apply multiple coats to achieve specified system dry film thickness. Typically, 100 – 150 microns (4.0 – 6.0 mils) dry film thickness can be achieved.

Wet film thickness readings should be taken periodically during application using a wet film comb or similar. Wet film thickness readings are a guide to the applicator to enable him to judge his application technique. They should be taken as frequently as necessary to enable a 'feel' for the material to be established.

Dry film thickness readings should be measured upon completion and any low areas should be brought up to specification.

Attention should be given to the pot life for this product when applying by brush and roller. Periodic cleaning (using recommended International solvents) will be required to prevent build-up of paint on the equipment and therefore retain 'workability', efficiency of transfer from brush/roller to steel and aesthetic requirements.

12. STANDARD OF COSMETIC FINISH

Intercure 4500 has been designed to provide long term colour and gloss retention. The degree of cosmetic finish attained is dependent on the quality of application, applicator experience and the equipment employed.

Typically, at a dry film thickness of 150 – 200µm (6 – 8 mils) a semi-gloss finish is achieved (30 – 50 gloss units @ a 60° angle measurement as per ISO 2813 or ASTM D523 depending upon colour). At higher dry film thickness, gloss levels will tend to increase.

The applicator is advised to use the maximum/minimum film thickness guidelines and avoid using a mixture of application techniques whenever possible.

Airless spray application will generally give the best results in terms of glossy, uniform films. The level of gloss and surface finish may be affected when using other techniques such as brush/roller application, which creates a more uneven appearance due to the presence of brush marks.

13. POSSIBLE FILM DEFECTS

Gloss Reduction
Above a relative humidity of 80% it is possible that the coating will noticeably reduce in gloss so regular 'environmental' measurements should be conducted throughout application. Overspray may also lead to gloss reduction and this is referred to below.

At temperatures exceeding 35ºC (95ºF) the rapid drying film properties may hinder good film flow which will result in perceived gloss reduction due to the subsequent uneven surface. The addition of 5-10% solvent in such instances may improve film flow where surface dry times are rapid. The thinning solvent should be either International GTA713 or GTA056.

"Orange Peel"
This is due to application technique and the effect can be minimised by thinning of the material and/or adjusting the spray/pump pressures and ensuring that the material is at a working temperature of 10ºC-25ºC (50ºF-77ºF). This effect normally occurs if the coating is applied with the gun held too close to the workpiece.

Over-Application
Intercure 4500 is tolerant to some over-application. However, excessive film thickness may lead to extended cure times and potential blistering, especially when operating at elevated temperatures.

It is advised that Intercure 4500 should not be specified at a nominal dry film thickness in excess of 200µm (8 mils) per coat.

Under-Application
If insufficient coating is applied then coalescence will be poor and the steel profile or primer will be clearly visible beneath the coating. Stripe coats should be applied to bolts, welds, angles, corners and other difficult areas which are likely to receive less than the specified film thickness. When the material is theoretically up to specified thickness, film thickness readings must be taken and any low areas brought up to specification.

Overspray / Dry Spray
Can be minimised by work planning (i.e. taking into account the rapid touch dry times), good spray technique, thinning, reduction of air pressure, sensible tip size, etc, depending on the structure to be sprayed (i.e. using a larger tip results in less "passes" to achieve a wet film although it will be more difficult to control the amount of paint being applied at any one time). If the effect is severe, leaving a rough, uneven surface, a further thin coat may have to be applied on top of it once it has dried sufficiently. Touch dry times can be attained in as little as 15-20 minutes given the right environmental conditions of high temperature and humidity. It is advisable not to apply a fresh coat which will overlap a drying coat if this time period has been passed.

For large areas or areas where overspray may be unavoidable, it is advised that the adjacent steelwork be covered or taped to prevent overspray damaging cosmetic appearance.

Overspray will have the appearance of poor coalescence and/or surface roughness.

Pinholes
Pinholes may occur as a result of application over porous substrates, hand-prepared substrates, surfaces that are suffering from overspray/dry spray or poorly cleaned surfaces containing dust debris. Surfaces should be suitably prepared before application commences. Pressurised air may be used to blow down the surfaces but it should first be checked for cleanliness to avoid further contamination of the substrate, e.g. to ISO 8573 or ASTM D4266. If pinholing is observed, holiday testing can be used to confirm whether or not there is a conductive route through to the steel surface.

Sagging
This is the result of excessive film thickness and poor spray technique or over-thinning. If the areas are greater than 100mm equivalent diameter, the coating should be removed and re-applied.

Soft Films
Films which show signs of being mobile after the hard dry time indicate lack of curing. This may be as a result of poor mixing, the addition of an alcohol-containing solvent or even omission of the curing agent and affected areas will require removal and re-application of Intercure 4500. Film hardness can be affected by temperature and humidity; at lower temperature and humidity the film will need further time to reach hard dry properties.

'Bubbling'
This can present itself where the film build is excessive or where moisture contamination has occurred. This can be avoided by ensuring that pot life is observed, that correct thinners are used for cleaning, environmental conditions are appropriate for application and part-used curing agent is not used. Good control of the dry film thickness will also help to ensure that bubbling does not occur.

14. MEASUREMENT OF DRY FILM THICKNESS

An electronic dry film thickness gauge capable of storing statistical data is strongly recommended to enable a meaningful DFT survey to be conducted. Refer to equipment manufacturer for calibration advice.

Tolerances

Specified thicknesses for Intercure 4500 are nominal, rather than minimum, values. Client specification on frequency and method of DFT measurement will take precedence; however, as a guide, ISO19840:2004 recommends the following tolerances:

- Individual dry film thicknesses of less than 80% of the nominal dry film thickness are not acceptable.
- Individual values between 80% and 100% of the nominal dry film thickness are acceptable provided that the overall average (mean) is equal to or greater than the nominal dry film thickness.

Care shall be taken to achieve the nominal dry film thickness and to avoid areas of excessive thickness. It is recommended that the maximum dry film thickness is not greater than 2 times the nominal film thickness.

15. INSPECTION AND REPAIR

Damage Down to Steel

For small areas of damage, single coat applications only:

Clean down to remove all dirt, grease, oil or other deleterious matter. Remove any loose coating and/or corrosion products by abrading the surface to a minimum of SSPC-SP11, feathering back the edges of sound coating by 50mm to provide a suitable overlap area. Care must be taken not to polish the steel.

Patch prime the bare areas using Intercure 4500 thinned by 5% (with the appropriate International thinner) using brush application, ensuring that it is worked into the profile of the steel to allow good adhesion. The coating can then be reinstated with unthinned paint by roller application to the required dry film thickness; this may require multiple applications, taking care to observe the relevant overcoating interval.

Damage Down to Sound Primer

Clean down to remove all dirt, grease, oil or other deleterious matter. Remove any loose coating by abrading the surface, feathering back the edges of the surrounding sound coating. The Intercure 4500 can then be reinstated by roller application to the required dry film thickness; this may require multiple applications, taking care to observe the relevant overcoating interval.

For large areas of damage or for multi-coat systems:

Surface preparation should be carried out as per the original standard, i.e., spot blast to IS 8501-1:2007 Sa2½ (SSPC-SP6), followed by reinstatement of the original specified protective scheme. It is advised that adjacent areas to the repair site be ‘masked’ off with tape to help prevent fine pin-holing at the edges of the repair site.

It is important to limit the amount of damage and subsequent repair work as much as possible so as not to detract from the overall appearance of the coating. By ensuring the correct film thickness is applied first time and that through dry properties are attained before handling, the amount of repair required can be minimised.

16. HEALTH AND SAFETY

Intercure 4500 is intended for use only by professional applicators in industrial situations in accordance with the advice given in this leaflet and on containers and should not be used without reference to the Material Health and Safety Data Sheets (MSDS) which International Protective Coatings has provided to its customers. If for any reason a copy of the relevant Material Health & Safety Data Sheets (MSDS) is not immediately available the user should obtain a copy before using the product.

Minimum safety precautions in dealing with all paints are:

- Take precautions to avoid skin and eye contact (i.e. use overalls, gloves, goggles, face mask, barrier creams etc.).
- Where possible provide adequate ventilation. In confined spaces with poor or no ventilation, use airfed hoods.
- If product comes in contact with the skin, wash thoroughly with lukewarm water and soap or suitable industrial cleaner. Do not wash with solvents. If the eyes are contaminated flush with water (minimum 10 minutes) and obtain medical attention at once.
- These coatings contain flammable materials and should be kept away from sparks and open flames. Smoking should be prohibited in the area.

Observe all precautionary notices on containers.