

Intertherm 751CSA 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 Intertherm 751CSA to correctly prepared surfaces.

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1. INTRODUCTION

Intertherm 751CSA is a novel high performance anti-corrosive that has been specifically designed to provide a corrosion resistant barrier when used to protect steelwork beneath thermal insulation in areas subjected to wet and dry cycling. It is capable of providing corrosion protection to steel in both atmospheric service and under thermal insulation operating in thermal cyclical conditions between to -196°C (-320°F) up to 650°C (1202°F) without the need for additional heat curing, prior to being placed in service.

This document gives detailed guidance on the use and application of Intertherm 751CSA and should be read in conjunction with the Intertherm 751CSA technical data sheet and material safety data sheet.

2. WHERE TO APPLY INTERTHERM 751CSA

Typically applied direct to metal, as a one or two coat system, Intertherm 751CSA is particularly effective in maintenance situations when used to mitigate the damaging effects of corrosion under insulation (CUI). Applications at thicknesses up to 200 µm (8 mils) in a single coat are also possible.

Intertherm 751CSA is suitable for use with steelwork in situations of continuous intimate contact with insulation operating at continuous in-service temperatures ranging from ambient up to 400°C (752°F). For service temperatures between 400°C (752°F) and 650°C (1202°F) however, please contact AkzoNobel for confirmation of specification prior to application.

Intertherm 751CSA is suitable for direct application to hot surfaces operating up to temperatures of 150°C (302°F) and has excellent resistance to "thermal shock" experienced during rapid temperature cycling and provides effective protection to steelwork operating under cyclic conditions in the critical CUI temperature range, recognized by NACE SP0198_2010 as -4 to 175°C (25 to 347°F).

3. STORAGE OF MATERIAL

Intertherm 751CSA should be stored in covered, dry conditions and kept in the temperature range of 0°C-40°C (32°F-104°F).

At lower temperatures, material will become slightly thicker and may require warming up, or thinning, prior to application. (See below). At higher temperatures, materials when applied will flow more easily and dry faster.

4. ENVIRONMENTAL CONDITIONS FOR APPLICATION

Intertherm 751CSA is moisture sensitive during both mixing and application and as such environmental monitoring is important for Intertherm 751CSA application. The following parameters apply and should be measured and recorded;

- The surface onto which Intertherm 751CSA is to be applied must be clean, dry and free from contaminants.
- Steel temperatures must always be 3°C (5°F) above the dew point.
- Relative Humidity during application and curing should ideally be between 40% and 85%.
- Minimum air temperature for application and cure is 5°C (41°F)
- Recommended application and cure temperature is >10°C (50°F)
- Rate of cure may be affected at low relative humidity (<25%).
- Moisture contamination may result in increased surface skinning of the mixed material and a reduction of pot-life.

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5. SURFACE PREPARATION

The performance level of Intertherm 751CSA is ultimately determined by the degree of surface preparation achieved prior to application. The higher the degree of surface preparation achieved, the greater the long-term performance.

Intertherm 751CSA may be applied direct to metal.

For optimum performance, all surfaces to be coated should be clean, dry and free from contamination. Prior to application all surfaces should be assessed and treated in accordance with ISO 8504:1992.

Where necessary, remove weld spatter, and where required smooth weld seams and sharp edges.

Where high levels of surface contamination are present thorough cleaning may be necessary prior to application. If in doubt consult International Protective Coatings for further guidance.

Abrasive Blast Cleaning

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

A sharp, angular surface profile of 50µm (2 mils) is recommended.

Power Tool Cleaning (small areas only)

Dependent upon service conditions, and performance level expectations, Intertherm 751CSA can be applied to areas prepared using power tools, provided that surfaces are to a minimum surface preparation level of SSPC-SP11, with a 40µm (1.6mil) irregular profile.

Note, all scale must be removed and all areas, which cannot be prepared adequately, should be spot blasted to a minimum standard of Sa2½ (ISO 8501-1:1988) or SSPC-SP6.

Lower levels of surface preparation e.g. St2/3 (ISO 8501-1:1988) or SSPC-SP2/3 are likely to show inferior long-term performance.

Please consult International Protective Coatings for the latest technical advice regarding this situation prior to commencing application of Intertherm 751CSA.

Ultra-High Pressure Hydroblasting / Abrasive Wet Blasting

Depending upon service conditions and performance expectations, Intertherm 751CSA may be applied to surfaces prepared to Grade HB2½M (refer to International Hydroblasting Standards) or Grade SB2½M (refer to International Slurry Blasting Standards). A sharp, angular surface profile of 50 microns (2mils) is recommended.

Stainless Steel

Ensure surface is clean, dry and free from metal corrosion products prior to commencing material application. Abrasive sweep blast using non-metallic and chloride-free abrasive (e.g. aluminium oxide or garnet), to obtain a recommended anchor profile of approximately 50µm (2 mils). Note: good adhesion will depend upon a high-density blast, with a minimum sharp angular profile of 40µm (1.6 mils).

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6. MIXING

This product is supplied in two components; a pigmented base component supplied in a drum and a small volume of accelerator in a small tin. The accelerator **must** be added to facilitate curing of this product.

Note: Intertherm 751CSA 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 unused material.

Due to the highly pigmented nature of Intertherm 751CSA, soft sedimentation of the base component can occur over time and as a consequence of transportation, particularly where long distances are involved. Correct mixing is essential to ensure that all settled material is reincorporated before application is attempted.

The importance of correct mixing is essential to ensure correct performance and cannot be over-emphasised.

Site experience has shown that an air driven reversible drill, fitted with a suitable mixing blade (e.g. 3" (7.6cm) Epimixer Blade, Ref. MR280B), will prove satisfactory for this purpose. The main points to remember when mixing Intertherm 751CSA are: -

- Do not mix more material than can be used within the pot life of the material.
- Where soft sedimentation exists, open the base tin and pour off approximately two thirds of the supernatant liquid to an empty, clean container.
- Thoroughly mix the remainder of the base component until it is fully reincorporated.
- Slowly add the supernatant liquid back into the base component with efficient mixing; ensuring that material does not overflow the container during this operation.
- When the material is totally reincorporated and free from lumps, add the accelerator component slowly, making sure that it is thoroughly incorporated.
- Ensure that during the mixing of the material the sides of the containers are scraped to incorporate any unmixed material from the sides. This should be done several times during the mixing operation.

Ensure that the tin is securely positioned during mixing.

7. POT LIFE

With Intertherm 751CSA no significant increase in viscosity is observed after mixing, even after long periods. However, if the stated pot life is exceeded, then the final applied film will have inferior properties and will not give the specified level of performance.

Intertherm 751CSA must not be applied after the stated pot life has been exceeded. Pot life times for Intertherm 751CSA are detailed on the product data sheet.

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8. AIRLESS SPRAY APPLICATION

Selection of the correct type of airless spray gun is important to achieving problem free application. The gun used should have the minimum amount of constrictions to material flow and preferably feed material close to the airless spray tip.

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 an output pressure of 141kg/cm² (2005psi). A typical line length of 30m (100ft) should be used with a minimum internal diameter of 9.5mm (3/8").

The preferred gun is a Silver Gun, Model 235-463, Series D (Graco), or an equivalent design where the product is fed direct to the tip; alternative designs where material is fed through the gun handle may result in dead spots developing, with consequent 'blockages' and 'packing' of the pigment occurring. Tip size can be from a minimum of 0.38mm (17 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 50°, to assist better wet film formation and reduced potential overspray.

Although this product is designed for application "as supplied" and should not require thinning in temperate conditions, under cold conditions [typically less than 10°C (50°F)] it may be advisable to add thinners – up to a maximum of 3% by volume of recommended International thinners.

9. AIR SPRAY APPLICATION

Conventional air spray with attached pressure pot is best achieved when using a DeVilbiss 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 but preferably a 1.8mm (70 thou) diameter.

A 12.5mm (½ inch) internal diameter fluid 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.

Thinning requirements are as for airless spray with up to 3% required by volume of recommended International thinners.

10. BRUSH AND ROLLER APPLICATION

Brush and roller are suitable application methods for Intertherm 751CSA; however, they are best used for small areas or areas where local site access prevents spray application. When using brush or roller, it may be necessary to apply multiple coats to achieve specified system dry film thickness. Typically 50-100µm (2.0-4.0 mils) dry film thickness per coat can be achieved by roller, 40-75µm (1.5-3.0 mils) by brush.

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.

Brush and roller can be used for application to 'hot' substrates which are <80°C (176°F).

11. STANDARD OF COSMETIC FINISH

Intertherm 751CSA is not designed to provide a high degree of cosmetic appearance. Polishing may occur due to the aluminium pigmentation; however, this is not detrimental to anti-corrosive performance. It should also be noted that different application methods will give rise to different visual appearance.

Depending upon the operating temperature, overcoating of Intertherm 751CSA with cosmetic topcoats for colour identification purposes may be possible. Consult International Protective Coatings for the latest technical advice.

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12. APPLICATION TO HOT SUBSTRATES

Intertherm 751CSA can be applied to substrates operating at elevated temperatures with a surface temperature up to 150°C (302°F). Addition of thinners should only be made to aid application if absolutely necessary, up to a maximum of 3%. When applying material to 'hot' substrates, it is important that appropriate consideration is given to the working environment, equipment, applicators' welfare and quality of the applied film.

With surface temperatures above 80°C (176°F) Intertherm 751CSA should only be spray applied.

Over-application and use of multiple thick coats should also be avoided to prevent solvent becoming entrapped within the applied material. Application of a heavy coat direct to the hot steel may result in film bubbling.

Measurement of applied film thickness on hot steel is not practical so it is recommended that an additional ambient test plate is sprayed using the thinned material, in order to assess how many coats will be required to achieve the specified DFT.

It is recommended that multiple thin-film coats are applied using a "wet on wet" technique (similar to application of "mist coats") until the required film build is achieved. For example, at 150°C (302°F) 7 to 10 mist coats with as little as 1 minute between coats maybe required to build up to the recommended 200µm (8 mils) dry film thickness. This will allow the solvent incorporated within the applied film to escape. Patchy and coalesced films can result in a significant difference in film appearance. Patchy films will tend to be darker in colour while well coalesced films will be lighter in shade with a metallic appearance as the aluminum within the coating aligns more consistently.

At higher temperatures (up to 150°C (302°F)), the self-self overcoating window will be significantly reduced.

When applying Intertherm 751CSA to substrates at elevated temperatures up to 150°C, consideration must be given to the increased levels of solvent vapour. It is essential that all relevant health and safety precautions are taken, and appropriate reference is made to local operating conditions, local site working practices and safe systems of work. A safe system of work should consider, but is not limited to, the increased chances of personal exposure, fire and explosion, control of ignition sources and static electricity, confined spaces, emergency arrangements, "hot work" and other permit requirements.

WARNING: The application of 751CSA to substrates at temperatures above 150°C or the use of unapproved materials within the elevated temperature application process e.g. thinners, may lead to conditions that give rise to an increased risk of auto ignition of materials, fire and/or explosion.



13. APPLICATION AS A SEALER COAT

Intertherm 751CSA may be used as a sealer for alternative corrosion protection materials such as Thermal Sprayed Aluminium (TSA).

Use of a mist coat of Intertherm 751CSA prior to full coat application should be performed to reduce or eliminate potential pinholing. Dependent upon film thickness targeted, thinning may be required with up to a maximum of 5% by volume of recommended International thinners.

Intertherm 751CSA can be used to protect field joints in TSA coated pipe and structures.

14. APPLICATION OF TOPCOATS

Intertherm 751CSA does not require topcoating for anti-corrosive performance. Topcoating may be required for identification purposes, such as safety colours. In these cases, Interthane 870 can be used for exposure up to 120°C (248°F) and Intertherm 875 or Intertherm 1875 up to 260°C (500°F). For best results, apply by conventional or air spray methods. Use of thinning solvents and topcoat over-application should be avoided.

15. POSSIBLE FILM DEFECTS

As an elevated temperature resistant coating Intertherm 751CSA may be applied to many different types of structures and equipment. As these structures are often large, and complex in design, the practicalities of site working make it inevitable that film defects can occur. The manner of application should be such that these are avoided or minimised.

A number of potential defects are detailed below, together with recommended remedial treatment.

- **Bubbling**

This may occur if a heavy coat is applied to hot steel and can be avoided by application of multiple thin film passes, similar to “mist coating” techniques.

- **“Orange Peel”**

Difficult to avoid but can be minimised by good spray technique, thinning of the material and ensuring that the material is at a working temperature of 15°C-25°C (59°F-77°F).

- **Over-application**

This is the result of excessive film thickness and poor spray technique.

Intertherm 751CSA is tolerant to a degree of over-application; however, excessive film thickness may lead to extended cure times and potential cracking when operating at elevated temperatures.

It is advised that Intertherm 751CSA should not be **specified** at a dry film thickness in excess of 200µm (8 mils) in a single coat and the total **applied** system dry film thickness in any situation should not exceed 350µm (14 mils).

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- **Overspray / Dry Spray**

Can be minimised by work planning and good spray technique, thinning, reduction of air pressure, increasing tip size and using less “passes” to achieve a wet film may assist. If the effect is severe, the surface must be cleaned by dry brushing prior to application to adjacent areas.

- **Pinholes**

This phenomenon can appear at different stages of the application process including overcoating of zinc silicates, self-self overcoating or application of topcoats and can be reduced or eliminated by following the guidelines below:

Zinc Silicate Primers:

Apply a mist coat of Intertherm 751CSA before full coat application. Thinning up to 3% with recommended thinners will aid wetting of the zinc primer.

Self-Self Overcoating:

Pinholing may sometimes be observed when overcoating Intertherm 751CSA with itself. This can be minimised by conventional or air assisted spray application. If this is not possible, then a multi-pass, thin coat application with short breaks between coats will allow the bubbles to pass through the wet coating and dissipate successfully. Alternatively, application of a thicker first coat followed by a thinner second coat also gives a successful result. Application of a thinned coat (maximum 20%), via airless spray application, may also be used as a cosmetic repair coat.

Topcoats:

Application by conventional or air assisted techniques gives best results. A multi-mist coat approach with short pauses between will allow time for any bubbles to pass through the wet film and dissipate successfully. Over-application should be avoided.

- **Polishing**

Due to the aluminium pigmentation of Intertherm 751CSA, the final film may be subject to a degree of surface polishing. While this does not cause any problems in terms of performance, cosmetic appearance may not prove acceptable if such films are to be permanently exposed.

- **Ripples**

Can often be unavoidable on complex sections, but can always be minimised by good spray technique.

- **Sagging**

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

16. MEASUREMENT OF DRY FILM THICKNESS

An electronic d.f.t. gauge, capable of storing statistical data, is very strongly recommended, to enable a meaningful d.f.t. survey to be conducted. Gauges should be calibrated on smooth plate.

- **Tolerances**

Specified thicknesses for Intertherm 751CSA are nominal, rather than minimum, values. According to ISO19840: 2004, the following tolerances are recommended: -

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.

17. INSPECTION AND REPAIR

Damage Down to Steel

Prepare substrate as per initial surface preparation i.e. spot blast to a minimum of Sa2½ or prepare by power tooling to SSPC-SP11, followed by a full coat of Intertherm 751CSA. If in doubt, consult International Protective Coatings.

18. HEALTH AND SAFETY

Intertherm 751CSA 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 air-fed 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.

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