

Interchar Single Pack Water Borne Intumescent Coatings Application Guidelines

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1.0 Introduction

Interchar 1120, Interchar 1160, Interchar 1190, Interchar 1260 and Interchar 1290 are single pack water-borne intumescent coatings designed to provide up to 120 minutes fire protection to structural steelwork.

Interchar 1120, 1160, 1190, 1260 and 1290 have been tested, assessed and certified in accordance with a range of standards, detail of which can be found on the relevant technical data sheets or by contacting International Paint

This document gives detailed guidance on the use and application of Interchar 1120, 1160, 1190, 1260 and 1290 and should be read in conjunction with the relevant Technical Datasheets and Material Safety Datasheets (MSDS).

Reference throughout this procedure is made to the UK document **ASFP Technical Guidance Document 11 Code of practice for the specification & on-site installation of intumescent coatings**

It is recommended that reference should also be made to the **European Industry Best Practice Guide on the Application of Intumescent Coatings to Constructional Steel**, available via www.cepe.org.

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2.0 Where to Apply

Water borne Interchar can be used in on-site application situations to provide fire protection on structural steel sections such as universal beams, columns and hollow sections.

In all cases, specific country approvals may be required. Consult International Paint for the latest information.

Interchar water borne coatings can be specified for interior environments such as those described in ISO12944 up to C3 corrosivity categories. Consult International Paint for specific recommendations.

Interchar water borne coatings can be used over a range of approved priming systems and overcoated with a range of approved top coats (refer to section 6 more details). Only approved primers and topcoats should be used; for use of other primers and topcoats, please contact International Paint for assistance.

An Interchar fire protection specification typically requires the following:

Surface Preparation: To provide optimum adhesion for the primer and Interchar to the substrate, in order to ensure sufficient adhesion for the developing char under a fire scenario.

Priming System: To provide anti-corrosive protection to the steelwork, Interchar must always be applied to a suitably primed steel substrate.

Interchar Product: In a fire scenario, the intumescent coating reacts to heat by rapidly swelling to produce a carbonaceous char which acts as an insulating layer between the steelwork and the elevated temperature of the environment.

The dry film thickness of the Interchar product to be applied will vary depending on the size and configuration of the individual steel sections along with the desired period of fire protection required. Dry film thickness figures for all Interchar products are available from International Protective Coatings.

Top Coat: Also known as sealer coats or finish coats, to protect Interchar from moisture ingress, provide a decorative cosmetic finish and reduce dirt and dust retention.

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3.0 Storage of Materials

Interchar should be stored in dry, shaded conditions and must be protected from freezing at all times during storage and transport. Frozen Interchar material shall be discarded and NEVER thawed and applied. The recommended storage temperature is between 4°C (39°F) and 25°C (77°F). To facilitate airless spray application characteristics, Interchar should be stored in a warm environment (15°C (59°F) to 25°C (77°F)) for at least 16 hours prior to commencement of spraying.

The shelf life of Interchar at 25°C is 12 months from date of manufacture, subject to re-inspection thereafter. Containers should remain sealed and unopened until needed and used in date order. Shelf life may be reduced at higher storage temperatures.

4.0 Environmental Conditions for Application

Interchar water borne coatings should be applied at air and substrate temperatures between 10°C and 50°C (50°F and 122°F). The surface must be dry and the surface temperature must always be a minimum of 3°C (37°F) above the dew point. In line with good painting practice, application should not take place in conditions which are deteriorating, e.g. where the temperature is falling and is likely to go below 10°C (50°F) or where there is a risk of condensation forming on the steel.

For optimum application and drying, the air and substrate temperature should be greater than 10°C (50°F) and relative humidity less than 80%. Application at temperatures below 10° (50°F) and at higher humidity will retard drying and could compromise the ultimate coating performance. Engineering controls to maintain conditions within the designated ranges such as electric powered heaters or dehumidifiers are recommended. Fuel fired heaters can create moisture and will be detrimental to the drying and curing of the Interchar.

Air movement is the most significant factor affecting the drying of water-borne paints. Good air flow and ventilation are always recommended to ensure there are no areas around the structure without ventilation. With little air movement, it is possible that an increase in the local relative humidity will soon reach unacceptable levels, resulting in extended drying/overcoating times and poor performance. Forced ventilation such as the use of portable fans in direct contact with freshly applied Interchar is not recommended as it can lead to surface defects, for example skinning or wrinkling. The recommended air movement is 4 air exchanges per hour.

Interchar water borne coatings must be protected from condensation and water during application and drying. They must always be protected from pooling, standing or running water, driving rain, high humidity/condensation even when topcoated. If in doubt, please consult International Paint.

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5.0 Surface Preparation

Correct surface preparation is the foundation for success of any coating application and intumescent systems are no exception.

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

Steel preparation before priming should be done in accordance with the recommended primers product data sheet. The minimum recommended surface preparation is Sa 2½ (ISO 8501-1:2007) or SSPC SP6/NACE 3

Primed Surfaces

The primer surface should be dry and free from all contamination and Interchar must be applied within the overcoating intervals specified (consult the relevant primer product data sheet). The primer must have been applied to a properly cleaned substrate as detailed above.

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. Sa2½ (ISO 8501-1:2007) or SSPC SP6, Abrasive Blasting, or SSPC SP11, Power Tool Cleaning (for small areas) and patch primed prior to the application of the Interchar product.

Should the primer's suitability for overcoating be in doubt in any way, for example, primer type unknown, primer not approved, excessive dry film thickness, surface contamination, surface glossiness etc, International Protective Coatings **MUST** be consulted prior to the application of any Interchar product.

6.0 Primers and Overcoating

Interchar water borne coatings must ALWAYS be applied over an approved priming system which will provide the required anti-corrosive protection to the steelwork over the lifetime of the structure it is protecting. It is not designed to give anti-corrosive protection alone and is therefore NEVER applied directly to steel substrates.

Interchar water borne coatings have been tested as part of a coating system for use in fire situations. A list of the approved primers can be found on the latest version of the relevant Interchar Product Technical Data Sheet. Please consult International Paint for current approved primers.

Typical primer dry film thickness recommended is between 40 and 75 microns (1.5 – 3 mils) depending upon primer product. Consult primer product data sheet for recommended primer thickness range.

The maximum recommended average dry film thickness for the priming system is 150 microns (6 mils). If the maximum primer thickness exceeds 6 mils DFT, consult International Paint for recommended actions.

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7.0 Topcoats

For the purposes of this document, topcoats are also referred to as “sealer” coats or “finish” coats.

Only topcoats approved by International Protective Coatings should be applied over Interchar products. A list of the approved topcoats can be found on the latest version of the relevant Technical Data Sheet. International Protective Coatings can advise on other suitable topcoats.

Prior to the application of the topcoat, the applicator must ensure that the specified dry film thickness of Interchar product has been achieved. Interchar water borne coatings should be allowed to harden sufficiently so that accurate thickness readings can be taken.

The surface of the Interchar must be clean, dry and free from contamination before overcoating with the topcoat. The topcoat must be applied within the overcoating intervals specified. Consult the relevant Interchar product data sheet for specific details.

Depending on the choice of topcoat colour, two or more coats may be necessary to achieve full opacity. The dry film thickness of topcoat required to give a uniform finish will also be influenced by the unevenness of the surface of the Interchar. It should be noted that the quality of surface finish is entirely dependent on the final surface appearance of the Interchar product; it is important that the Interchar is applied and finished to the required quality prior to application of any topcoat (see section 10 for further information).

Where Interchar products are to be subjected to environmental conditions other than internal dry (C1 as defined in ISO 12944-2), then a topcoat **MUST** be applied. **Even when the Interchar system is correctly topcoated, any contact with ponding, standing or running water must be avoided.**

The minimum overcoating interval for Interchar water borne coatings with all topcoats is 24 hours.

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8.0 Airless Spray Application

Power stirring is essential to ensure that the coating is mixed to a uniform consistency. Hand held air driven mixers are the most common and are ideal for this purpose, preferably with a helical style shaft. Material should not be stirred excessively, due to the risk of incorporating excessive air.

Interchar is supplied ready for use. DO NOT DILUTE OR THIN WITH SOLVENT OR WATER

Manual mixing (e.g. using a palette knife) is not recommended.

Airless spray pumps capable of achieving a minimum pressure at the tip of 2500psi (175kg/cm²) are recommended. Electrically driven airless pumps capable of achieving the above parameters have also been found to be suitable.

For air driven airless spray pumps the following modifications to the normal set up are recommended:

- Remove any wet end extension hose and place the wet end directly into the coating.
- Place the pail or drum so that condensation from the pump does not run into the coating.
- The pump should be fitted with a filter to prevent contamination from external sources from entering the spray machine and causing blockages.
- Refer to Equipment Quick Reference Table in Section 9.0.

Multiple Coat Application

Where the specified dry film thickness (dft) of the Interchar coating is greater than 700 microns (28 mils), the total thickness should be built up in two or more applications, using the recommended overcoating windows from the technical datasheet. Up to a maximum wet film thickness of 1000 microns (40 mils) per coat can be applied. Prior to overcoating ensure the previous coat is dry. Particular attention should be paid to the internal angles of flanges and webs where excessive build-up of paint can occur and air flow may be restricted. Excessive paint application in these areas can be removed by simply smoothing with a small paint brush down the internal angles whilst the paint is wet.

Drying can be optimized by maintaining air temperatures above 10°C by improving air flow, particularly in areas where natural air flow is restricted and by keeping relative air humidity as low as possible. Drying times will be optimized if successive coats are of similar thickness. For further advice on overcoating intervals contact International Paint.

During application it is important that the applied wet film thickness is continually monitored to ensure the required thickness is being applied. Good control of thickness per coat will facilitate more rapid job completion.

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9.0 Brush and Roller Application

Application of Interchar water borne coatings by brush or roller is a suitable method but is generally recommended for small areas and repairs only*.

Between 250-400 microns (10-16 mils) wet film thickness can be achieved per coat. For a typical dry film thicknesses required for 2 hour fire protection, multiple coats applied by brush or roller will be required.

The appearance of brush or roller applied Interchar will be different to that of the spray applied coating, which will provide the smoothest finish.

Equipment Quick Reference Guide

Spray Pumps	Airless Spray Units capable of supplying a minimum 175kg/cm ² (2500 psi) output fluid pressure at the spray tip
Filters	80 – 100 mesh in manifold screen on siphon hose
Hoses	Max 60m (200 linear feet) of 13mm (0.5in) bore
Whip Line	Optional max 2m (6ft) of 6.5mm (0.25in) bore
Spray Tips	0.41 – 0.54mm (0.015 - 0.021in)
Fan Angle	20 - 40 degrees dependent upon steel section
Finish	Smooth to slight orange peel
Brush	Brush for applying latex paint
Roller	Low nap or foam roller
Clean up	Water

***N.B. Interchar 1260 is not recommended for roller application.**

10.0 Standard of Cosmetic Finish

The cosmetic finish of Interchar water borne coatings will vary depending on the method of application. Spray application of the coating is generally considered to give a superior appearance to brush application.

Particular requirements for the quality of the finish should be stated in the specification. For non-visible areas, for example, the standard of finish achieved may not be of concern.

At the outset of a project it is strongly recommended that a sample area is prepared and the standard of cosmetic finish is agreed by all parties concerned.

ASFP Technical Guidance Document 11 section 2.1.11 outlines three standards which can be specified:

i) Basic Finish

The coating system achieves the required fire performance and corrosion protection performance but is not required to achieve any requirement for standard of finish.

ii) Decorative Finish

In addition to the requirements for (i) above, a good standard of cosmetic finish is generally required when viewed from a distance of 5 metres. Minor "orange peel" or other texture resulting from application or localised repair is acceptable.

iii) Bespoke Finish

In addition to the requirements for (i) above, the coating finish is required to have a standard of evenness, smoothness and gloss agreed between the Specifier and Contractor.

More work will be required to achieve the higher standards. It may be necessary to abrade the Interchar surface to remove texture. It may also be necessary to apply the Interchar in a series of thinner coats.

Topcoats are relatively thin and will tend to highlight rather than hide surface defects. It is, therefore, important to ensure that the required finish has been achieved prior to application of the topcoat.

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11.0 Possible Film Defects

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

Over-Application

Excessive film thickness will lead to extended drying and may lead to other surface defects. This will be more apparent in areas such as corners and internal angles of universal sections and may result in hairline cracking in these areas. This cracking is not detrimental to the integrity or fire performance of the Interchar. To eliminate these effects, caution should be exercised when coating narrow-webbed sections. If necessary to control the film thickness in these areas the applied wet film thickness per coat should be reduced from the 1000 microns maximum

Overspray / Dry Spray

Any dry overspray of Interchar onto adjacent primed steelwork should be removed from the surface prior to application of the Interchar. Failure to do so may impair adhesion and affect final appearance.

Overspray present on Interchar may give a rough appearance to the surface. Sometimes this can be dusted off but abrasion may be required to achieve a satisfactory smooth finish onto which a topcoat can be applied in order to satisfy the requirements for cosmetic appearance.

Overspray can be minimised by good work planning and good spray technique such as reduction of air pressure, sensible tip size, etc, depending on the structure to be sprayed. The sprayer should be close enough to the work surface at all times to minimise airborne overspray without leading to excessive ripples or other texture in the coating caused by the pressure of the spray. All dry overspray must be removed prior to topcoating Interchar.

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 a non-closed film and/or surface roughness.

Sagging

This is the result of excessive film thickness and poor spray technique or over-thinning. Any areas which are subject to this should have the coating removed and re-applied.

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13.0 Measurement of Dry Film Thickness

After sufficient drying time a survey of the dry film thickness should be carried out using a suitable calibrated gauge. An electromagnetic induction instrument with a statistical function to store readings and give an average is most useful. Where dry film readings include a primer and/ or top coat an allowance must be made for these coatings and subtracted from the total reading.

The following is the recommended procedure for measuring dry film thickness and acceptance criteria based on **Section 4.7 Dry Film Thickness, ASFP Technical Guidance Document 11**. Readings should be taken on every steel section as follows:

I Sections, Tee Sections and Channels

Webs: Two readings per metre length on each face of web
 Flanges: Two readings per metre length on the outer face of each flange
 One reading per metre length on the inner face of each flange.

Square and Rectangular Hollow Sections and Angles

Two readings per metre length on each face.

Circular Hollow Sections

Eight readings per metre length evenly spread around the section

Where members are less than 2m in length, three sets of readings shall be taken, one at each end and at the centre of the member. Each set shall comprise the number of readings on each face as appropriate.

Indicative dry film thickness readings can be taken on Interchar products which have not fully hardened. This can be achieved by taking the readings over a shim using the following simple steps;

- Place a rigid shim of known thickness on the Interchar surface
- Take readings over the shim.
- Subtract the thickness of the shim, and the primer and topcoat if applied, to give the dry film thickness of Interchar product.

This will give an indication only of the dry film thickness of the Interchar material.

Dry Film Thickness Acceptance Criteria

The average thickness of each steel section should be equal to, or greater than, the specified thickness. Where any single thickness reading is found to be less than 80% of the specified thickness, a further three readings should be taken on the same face within a 300mm radius of the low reading.

If one or more of the additional readings are also less than 80% of the specified thickness, further readings should be taken to establish the extent of the area of under thickness and the whole area should be brought up to the specified thickness.

Individual thickness readings of less than 50% of the specified thickness are not acceptable.

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The average measured dry film thickness of any steel section should not exceed by more than 10% of the maximum stated dry film thickness for the particular steel shape and orientation (as quoted in the latest published loading tables for the specific Interchar product).

Other measuring schedules and acceptance criteria are in use, for example the AWCI (Association of Wall and Ceiling Industries) Technical Manual 12-B.

Correction Procedure

Final dry film thickness of the Interchar that is not compliant with the appropriate fire design listing will require remedial action.

Areas of low thickness may be random but frequently a pattern can be observed e.g. low thickness tending to occur on inner flanges. Additional material should be applied to ensure conformance with the dry film thickness acceptance criteria stated above

The surface of the existing Interchar coating must be clean, dry and free from all contamination. If the topcoat has already been applied it will need to be removed.

Where the dry film thickness exceeds the recommended limit, guidance should be sought from International Paint.

Dry Film Thickness of the Topcoat

The top coat dry film thickness is difficult to measure due to the variation in thickness of the underlying coats of intumescent and its own relatively low thickness in comparison.

It is, however, important that the topcoat is applied at the specified thickness to ensure the longevity of the system without applying excessive thickness. Judging the thickness of the top coat is also made more difficult as an uneven surface will require more coating to achieve a uniform appearance. As a guide, the number of spray gun passes to achieve the required wet film thickness can be determined by spraying on to a smooth surface. Monitoring of material usage will also give an indication of the applied thickness.

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14.0 Inspection and Repair

The repair method will depend upon the extent of the damage. Repairs should be carried out at the earliest opportunity using the appropriate procedure from those given below.

Damage Down to Steel

Remove unsound and damaged coatings to a neat firm edge with sound adhesion. Remove all corrosion products. For limited small areas prepare steel surface in accordance with SSPC SP11 without polishing the substrate. For large areas of repair the exposed steel surface should be prepared by abrasive blasting to a minimum standard of Sa2½ (ISO 8501-1:2007) or SSPC-SP6.

Feather coat edges by abrading. Reinststate the original or other priming system recommended by International Paint. Avoid overlap of primer onto surrounding Interchar. Reinststate the Interchar within the recommended overcoating limits of the repair primer.

Apply Interchar in multiple applications by brush. If a topcoat has already been applied to the existing system, minimise overlap of fresh Interchar product over the existing topcoat. Apply topcoat as appropriate.

Damage Not Requiring Primer Repair

Depending on severity of damage, either lightly abrade the damaged area to a feathered edge, or cut out a suitable area of Interchar and feather out the edges. If cutting out, do not damage the priming system, otherwise repair as for damage down to steel will be required.

Reinststate Interchar to the required dry film thickness using the method described above. After the appropriate overcoating interval apply an approved topcoat in accordance with original specification.

Hairline cracks are not detrimental to the integrity or fire performance of the Interchar. Where they do occur repairs can be carried out by application of a brush coat of Interchar or a stripe coat of topcoat followed by a full coat of the topcoat

Damage to Topcoat Only

Remove loose or unsound coatings to a firm edge and feather the edges. All surfaces should be clean, dry and free from all contamination.

Reinststate top coat in accordance with original specification.

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Future Inspection and Maintenance

The fire protection properties of the Interchar systems will remain as long as the integrity of the coating is maintained. Regular inspections of the Interchar fire protection system should be carried out. Any defects, damaged areas etc. must be repaired as recommended above.

The inspection intervals for a project should be stated in the specification. Typically, inspections should be carried out annually.

Topcoats must be maintained as a continuous film to protect all Interchar products from the environment. However, excessive build-up of top coat thickness could be detrimental to the fire protection system and must be avoided. As a guide the maximum recommended number of topcoats is two, applied at 50 microns DFT per coat.

Only approved topcoats can be applied over all Interchar products. For further information contact International Paint.

15.0 Health and Safety

Interchar is intended for use only by professional applicators in industrial situations in accordance with the advice given in this document 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 and Safety Data Sheet is not immediately available, the user should obtain a copy before using the product.

- Ensure that all typical personal protective equipment is used, e.g. overalls, gloves, goggles, face mask, barrier creams etc.
- Provide adequate ventilation.
- If product comes into 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.
- Observe all precautionary notices on containers.

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