Interchar 212
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 Interchar 212 to correctly prepared surfaces.

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1. INTRODUCTION

These Application Guidance Notes contain advice on application of Interchar 212 intumescent systems.

Passive fireproofing materials prevent potentially catastrophic structural failures from occurring by providing an insulating shield against the intense heat of a fire. The Interchar 212 fireproofing system is the result of over 30 years of research and development and possesses extensive certification for a wide range of fire protection ratings.

This document is subject to the following;

1. Compliance with individual country standards concerning fire resistance,
2. All equipment being suitable and fully serviced prior to use for Interchar applications.
3. All applicators being competent in the application of non-standard high performance coatings.
4. All Health & Safety recommendations of the equipment manufacturer being followed.

2. SYSTEM DESCRIPTION

Interchar 212 passive fireproofing system consists of a two pack epoxy intumescent mastic.

Interchar 212 can provide effective fire protection to a very wide range of steel structures in cellulosic fire scenarios, whilst also providing protection against corrosion. In a fire, Interchar 212 fireproofing will intumesce (expand) to a thickness much greater than that of the applied coating to form an insulating blanket of char. It is this char and its formation that protects the substrate from fire damage.

3. SURFACE PREPARATION

Degreasing

The presence of surface oil or grease prevents a coating from properly adhering to the substrate and can lead to rapid failure of the whole system. For this reason, all visible oil, grease and other soluble contaminants must be removed before the application of both primer and Interchar 212. Degreasing is also important before blast cleaning activities.

Cleaning and degreasing should be carried out to SSPC-SP1 standard.

Methods of degreasing include:

- wiping or scrubbing the surface with rags or brushes wetted with solvent (*NB: use clean solvent for the final wiping*)
- steam cleaning using detergents or emulsion/alkaline cleaners followed by steam or fresh water wash to remove detrimental residues.

The applicator should select the method most appropriate to the situation, giving due consideration to relevant health and environmental regulations. Heavy oil or grease deposits should be removed first by scraper, followed by detergent washing (or solvent cleaning) and a thorough fresh water rinse.

Abrasive blast cleaning

Abrasive blast cleaning is widely accepted as being the best way of preparing a metallic substrate (usually steel) before application of a protective coating and it is a very important part of the whole application process. When a primer is used, blast cleaning should be carried out in accordance with the requirements on the primer technical data sheet.

The general requirement is blast cleaning, to Sa2½ (ISO 8501-1:2007) or SSPC-SP6 with a sharp angular profile being obtained. The blast profile should be a minimum of 50 microns (2 mils) for steel substrates. Blast profile can be measured using replica tape or surface profile comparators.

Galvanised substrates should be prepared by sweep abrasive blasting to provide a roughened surface, to a standard similar to Sa 1 (ISO 8501-1), SSPC-SP7 or NACE No. 4. Typically a profile of 15-25 microns is achieved by sweep blasting. Caution should be exercised as aggressive blast cleaning runs the risk of removing the galvanising

Power tool cleaning

See Table 1 Note 1. Power tool cleaning may be used on small areas, typically for touch up and repair areas and should be carried out to SSPC-SP11 standard. Ensure that the surface of the steel does not become polished

Table 1: Interchar 212 Surface Preparation Chart

OPERATION REQUIRED	*STEEL*	*GALVANISED STEEL*
Degreasing	✓	✓
Power Tool Cleaning	See Note 1	
Near White Blast Cleaning	✓	
Sweep (Brush-off) Blast Cleaning		✓
Debris Removal e.g. Vacuuming	✓	✓
Primer	✓	✓

Note 1: Small areas (not exceeding 1m^2 (1550in^2), for example welds and local repair areas, should be prepared by power tool methods to achieve a clean, roughened surface in accordance with SSPC-SP11, power tool cleaning. A minimum profile of 50 microns (2 mils) must be maintained. Power tool cleaning is not an acceptable primary surface preparation method for steel.

4. PRIMERS

It is possible to apply Interchar 212 directly to blast cleaned steel, if the relevant country approval allows this but environmental factors (temperature, time, humidity etc), may make it necessary to prime the substrate to prevent deterioration of the blast.

To ensure optimal bonding between the Interchar 212 and substrate, correct primer type and thickness are required.

Primer Thickness

Optimal bonding is achieved when the primer's dry film thickness (DFT) is sufficient to just cover the peaks of the blast profile and maintain a rust free condition prior to application of Interchar 212. Maximum primer thickness is dependent on individual primers and careful monitoring and measurement of primer thickness is required. DFT measurement should be carried out in accordance with a recognised standard such as ISO 2808, SSPC PA2 or ASTM D1186

The **maximum** allowable primer system DFTDFTs are summarized in the following table:

Table 2: Primer System Maximum DFTs

Primer System	**Dry Film Thickness**	
	Normal Areas	*Overlap Areas*
Epoxy primer (e.g Intergard 251)	50-75 microns (2-3 mils)	150 microns (6 mils)
Epoxy zinc primer (e.g Interzinc 52)	50-75 microns (2-3 mils)	150 microns (6 mils)
Epoxy zinc primer plus tie coat	75-110 microns (3-4.4 mils)	150 microns (6 mils)

NOTE: In areas of difficult access, such as internal angles, etc, where multiple spray passes are unavoidable, thickness should be carefully monitored and controlled.

Reduction of Excessive Primer Thickness

Excessive primer thickness should be reduced to the DFTDFTs indicated in Table 2. The preferred method to be used is abrasive sweep blasting. Sanding with P60-P80 grade aluminium oxide abrasive paper may be suitable for small areas; however, care should be taken to prevent polishing of the surface which would lead to inadequate adhesion of the Interchar 212. Frequent changes of the abrasive paper should be made.

After primer reduction surfaces should be cleaned of dust and contaminants and be thoroughly dry immediately prior to the application of Interchar 212.

Primer Type

Generally two-component epoxy-based primers are used with Interchar 212. Only primers approved by International Protective Coatings can be used. Approved primers are indicated on the technical data sheet. However this list is not exhaustive and International Protective Coatings can be consulted for enquiries on specific primers. Care should be taken to ensure that primer systems have reached sufficient levels of cure prior to overcoating with Interchar 212.

Typically the recommended primers for Interchar 212 have extended maximum overcoating times.

It is the applicator's responsibility to ensure that the primed surface and the primer itself are in an acceptable condition for overcoating with Interchar 212. Such factors as ageing of the primer (degradation and surface chalking), contamination, zinc salt formation, rust, bloom, etc. shall be considered when determining a surface's suitability before overcoating with Interchar 212.

In all situations the surface of the primer must be clean, dry and free of all contaminants immediately prior to overcoating with Interchar 212.

Any primer surface that is showing indications of UV degradation such as surface chalking or has exceeded its maximum overcoating period will need to be treated by abrasion e.g. sweep-blasting prior to overcoating. Areas of rust breakthrough should be abrasive blasted back to Sa2½ (ISO 8501-1:2007) or SSPC-SP6 standard and the primer re-applied.

Amine bloom formation on the primer surface can be removed by high pressure water-washing at a minimum of 170 bar (2500 psi).

If epoxy zinc primers such as Interzinc 52 are exposed to humid or outdoor conditions prior to application of Interchar 212, zinc salts may be formed on the surface which is detrimental to adhesion of the Interchar 212. These will need to be removed prior to application of the Interchar 212. Typically this is achieved by high pressure water-washing at a minimum of 170 bar (2500 psi). If stubborn salts persist then brushing or another abrasive method will need to be included with the water-washing. Alternatively, an epoxy tie coat may be applied over the epoxy zinc primer to prevent salts forming.

Prior to overcoating the applied primer, dry film thickness checks should be made to ensure that the tolerances set out in Table 2 are not exceeded.

5. AMBIENT CONDITIONS

Suitable application conditions are of critical importance for the successful application of Interchar 212. Consequently, it should be applied when the ambient conditions are within the following parameters:

- Air temperature: minimum 10°C (50°F), maximum 50°C (122°F)
- Relative humidity: maximum 85%
- Surface temperature: at least 3°C (5°F) above dew point temperature less than 50°C for heated plural application and less than 60°C for hand application

Interchar 212 may be applied at an air temperature of minimum 5°C (41°F) using plural spray equipment only, recognizing that the time to cure will in such applications be extended. This should only be undertaken where there is no alternative to modify the ambient conditions. Additionally, there may also be a higher propensity for amine bloom formation which would affect over-coating with further layers of Interchar 212, where required, and may affect over-coating with topcoats. For such low air temperature applications, plural equipment is the only recommended dispensing method.

In climates where there is direct sunlight with temperatures up to 50-60°C or there is a likelihood of condensation, application should be conducted in an encapsulated area and dehumidification equipment provided where required.

6. STORAGE CONDITIONS

Interchar 212 should be stored indoors and out of direct sunlight.

The following storage temperature ranges must be maintained:

1. General storage: Minimum 5ºC (41ºF), maximum 30ºC (86ºF).
2. For plural component spray application must be maintained at a temperature of 30–34ºC (86–93ºF) for 24 hours (maximum 48 hours) prior to use.

Accelerated methods of heating Interchar 212 containers prior to use, such as electrical heaters in direct contact with the containers or hot water baths, are not permitted. Such methods will cause non-uniform heating and overheating of the outer layers of material in the container. This will produce undesirable changes to its properties (including shorter pot life).

7. SURFACE FINISH

Surface anomalies such as discontinuities, pinholes, voids or isolated deposits of excess thickness in the coating are not acceptable.

Where there is the risk of water ponding on horizontal surfaces, coated articles should be stored (prior to erection) either under cover or sloped sufficiently to allow run-off and so avoid standing water.

Samples of the surface finish acceptable to the client should be prepared by the applicator and agreed prior to job start-up. These can be used as reference areas against which ongoing work can be assessed.

Interchar 212 is pigmented during manufacture to give its characteristic colour and is not matched to a specific shade. Therefore, colour adjustment is not part of the QC programme during manufacture and subsequently some colour variation in the finished film is possible and normal. In addition, the colour of the cured film can be appreciably different from mixed material in its liquid state and from the individual components.

Please see Appendix Guidelines for Achieving an Improved Finish Quality for more details regarding surface finish.

8. APPLICATION WITH PLURAL SPRAY EQUIPMENT

Plural Component Spray Equipment

As Interchar 212 is a thixotropic material, it is most efficiently applied with purpose built hot spray plural component pumps, which have the advantage of not requiring any premixing of the two parts.

For Interchar 212 the application parameters possible depend on a number of factors (e.g. environmental conditions, equipment type, etc) and are as follows:

1.	Storage tank temperatures	Part A: 35º-60ºC (95º-140ºF) Part B: 35º-50ºC (95º-122ºF)
2.	Hose heater temperature	45-65ºC (113º-149ºF)
3.	Gun exit temperature	40-55ºC (104º-131ºF)
4.	Storage tank pressures (see Note 2)	Part A: 4.10 – 6.90 bar (60-100 psi) Part B: 2.00 – 4.10 bar (30-60 psi)
5.	Tank stirrer speed	10-30rpm
6.	Displacement pump pressure	175-276 bar (2500-4000 psi)

Fluid lines and spray tips:
Part A: ~18mm (¾") internal diameter fluid lines
Part B: ~12mm (½") internal diameter fluid lines
Whip length: 4.5 – 6.0m (15 – 20ft) with ~12mm (½") internal diameter
Suggested tip size: 0.035" to 0.041"

Note 2: Ability to vary tank pressures is critical to achieve the correct weight mix ratios. Tank stirrers should also have the capability of speed variation.

It is necessary to provide controlled heated storage for the Interchar 212 and advisable to place the machine in a modified insulated container for work at low air temperatures.

The importance of keeping all spray equipment clean and efficient cannot be overstated, as down time is very costly. For this reason a skilled and experienced machine operator is a vital component of the team, together with a regular maintenance or service programme for the equipment.

Plural component equipment used to apply Interchar 212 must be capable of delivering the required pressures, temperatures and flow rates as well as be capable of operating reliably for long periods under a wide range of conditions. Machines built to spray Interchar 212 are supplied by a number of companies. Each supplier provides instructions on machine operation and maintenance and should be able to advise on the individual set up required to achieve best application qualities. This information is given for advice only and the contractor is repsonsible for determining the suitability of specific pieces of equipment and maintenance of the equipment in good working order according to the manufacturer's recommendations.

Ratio Checks

It is important that the delivery ratio of plural spray pumps is regularly checked. As a minimum, a ratio check by weight should be performed at the start-up of each day's production and again if the machine is shut down and restarted for any reason. Use the following procedure for ratio checks by weight:

1. *Weigh clean empty Parts A and B containers and note the respective weights.*
2. *Place the containers under the ratio check valves located on the mixing block and open the valves at exactly the same time.*
3. *Close the valves at exactly the same time when the containers are at least half full*
4. *Find the net weight of each part by subtracting the weight of the containers.*
5. *Calculate the ratio of Part A to Part B.*

Example:

Part A empty container weight – 2.3kg (5.0lb)
Part B empty container weight – 1.2kg (2.6lb)

Part A full container weight – 9.4kg (20.7lb)
Part B full container weight – 4.1kg (9.0lb)

Part A net weight – 7.1kg (15.7lb)
Part B net weight – 2.9kg (6.4lb)

As a minimum a ratio check should be carried out at the start of each shift and after each machine shutdown and restart. In addition to the ratio checks, constant checking of the displacement pump pressure gauges and the colour of the mixed Interchar should be carried out by the machine operator and sprayer respectively.

The **weight ratio** for Interchar 212 is 2.49:1.

The acceptable ratio range of Part A to Part B is:

2.37:1 Minimum
2.61:1 Maximum

Where values are found to be outside the acceptable range, please contact International Protective Coatings for further advice.

Film Density

Interchar 212 film density can vary significantly depending on equipment setup and application technique. Therefore, equipment settings and technique appropriate to achieve the target film density should be determined prior to the commencement of work and monitored throughout the project. Incorrect equipment setup and/or application technique can result in film densities above the target range and excessive material consumption.

Application Method	**Target Film Density (g/cm3) determined using ASTM D792-00 method A**
Trowel Application	1.2 +/- 0.1
Single Component Airless	1.1 +/- 0.1
Heated Plural Component Airless	1.0 +/- 0.1

Application

Interchar 212 can be rolled to achieve a uniform thickness of the coat, which allows uniform build-up of subsequent coats and ultimately the correct final thickness. Rolling also serves to produce a smoother surface finish, when required. Rolling can be carried out using a short nap roller dampened with International Protective Coatings thinner GTA123 (or GTA822). Refer to Appendix 2 Guidelines for Achieving an Improved Finish Quality.

Two considerations to bear in mind with rolling are that if the Interchar 212 has not gelled (started to cure) sufficiently, it can sag or slump and that too much solvent on the roller can reduce the cure rate if it is forced into the wet Interchar 212.

For subsequent coats, sufficient time must pass for the applied Interchar 212 to gel ("set up" or partially cure) in order to support the weight of the additional material.

Preferably, subsequent coats should be applied when the previous coat is still tacky. Where practicalities prevent "wet on wet" application, overcoating time should be reduced to a minimum.

When the overcoating time is longer than 24 hours, a sprayed holding coat should be applied to leave the Interchar 212 with a good key to improve the adhesion of the next coat. The holding coat is produced by boosting the Interchar 212 temperature (in the plural component spray equipment) and/or raising the pump output pressure to give a wide fan and increased atomisation. The spray pass is much faster than normal and the result is a coarse finish that promotes good bonding with subsequent coats.

The final coat of Interchar 212, when applied to a 'wet' surface, should be sufficiently thick to allow good 'flowing out' and to minimise surface roughness and to achieve the specified final thickness.

In applying the final Interchar 212 coat to a hardened surface the thickness should be no less than 3mm to ensure adequate adhesion to the hardened surface.

In hot conditions, i.e. air temperature above 40ºC, the spray unit and Interchar 212 should be located in an air-conditioned environment. Hoses should be insulated and wrapped with heat reflecting tape. It may also be necessary to raise hoses above the ground in extremely hot environments. High substrate temperatures should be avoided by providing suitable shade cover and air-conditioning of the area immediately surrounding the workface may also be necessary.

***CAUTION*: During application and curing, the surface should be protected from moisture (e.g. rain, high humidity, etc) as required. These conditions could affect intercoat adhesion with subsequent coats.**

If water contamination occurs, cured material can be dried and solvent wiped. Water damaged uncured material should be removed and replaced.

Frequently shutting down spray machines can cause pressure build up in the material lines and spray gun, which may represent a safety hazard.

9. THICKNESS MEASUREMENT

As the fire protection rating is determined by the Interchar 212 thickness, it is imperative that applicators constantly measure and record thicknesses during application.

Interchar 212 is a 100% volume solids product, so wet and dry film thicknesses are the same.

The following procedure for thickness measurement must be followed:

A. Method for measuring wet thickness:

The recommended method of measuring wet thickness is to use a pre-cut bridge gauge. Typically made from a putty knife, widths of between 40 and 100mm (1.5 – 4.0 inches) have been found to be most appropriate Notch or pin gauges are not acceptable because they limit the measurement to one point. The gauge should just touch the rolled surface. International Protective Coatings strongly recommends the continuous use of the bridge gauge by all members of the application team (sprayer, trowellers and rollers). This is the only way of ensuring the design thickness will be applied to the whole surface.

B. Method of measuring dry thickness:

Dry film thickness can be measured by either of the following methods:

- drilling a small hole approximately 2mm or $^{5}/_{64}$" in diameter and checking the Interchar 212 thickness with a depth gauge (care must be taken not to damage the substrate and to refill the holes with Interchar 212 as soon as possible);
- using an electromagnetic or ultrasound thickness gauge (care must be taken to correctly calibrate on a smooth calibration plate the gauge immediately before taking any readings).

It is recognized that the applied Interchar 212 layer will never be perfectly even and that areas of lower than specified design thickness ("valleys") are compensated by areas of higher than design thickness ("peaks").

Unless specifically stated otherwise in the project documentation, the minimum acceptable thickness at any point shall not be less than 85% of the design thickness up to a maximum of 1.5mm ($^{1}/_{16}$") less than the design thickness. In other words, for thicknesses up to and including 10mm ($^{3}/_{8}$") the minimum allowable thickness is 85% of the design thickness. For thicknesses above 10mm ($^{3}/_{8}$") the minimum allowable thickness is the design thickness less 1.5mm ($^{1}/_{16}$").

In all cases, the average thickness must be at least the specified passive fireproofing design thickness.

The number of thickness readings to be taken should be decided by all parties before commencing application, and ideally be made with reference to local standards for the measurement of fire protection thicknesses.

Thickness readings should be accurately recorded.

10. APPLICATION USING MODIFIED SINGLE LEG EQUIPMENT

Application with single leg equipment is not as efficient as with plural component. More product wastage will occur and guidance notes labour requirements are likely to be higher. Usage rates up to 10% higher than those stated on the data sheet are likely to occur.
International Protective Coatings recommends the use of the plural component equipment whenever possible.

To facilitate application with single leg equipment the Interchar 212 Part A and Part B material should be maintained at a temperature of 21-27ºC (70-80ºF) for a minimum of 24 hours prior to use.

Mixing

A small amount of International Protective Coatings thinner GTA123 (or GTA822) may be added to reduce viscosity for mixing and spraying. The amount required varies with initial material temperature but up to maximum 1.0 litre (0.25 US gallons) may be used per full kit of Interchar 212 and is added into Part A.

For mixing purposes a high torque, variable speed, paddle mixer of minimum 5 HP air motors (or 1000W/110V electric motor minimum) equipped with 250mm (10") diameter paddle should be used. Part A must be thoroughly mixed until it is homogeneous and has reached a smooth consistency; Part B is then poured into the Part A container, scraping the sides of the Part B container to empty it completely. The two parts are then thoroughly mixed together. The internal sides of the mixing container should be scraped regularly as the mixing proceeds, to ensure no unmixed Part A material remains adhered to the sides

For best results, the mixer should be mounted on a power ram base to ease the effort required and to allow vertical movement of the paddle blade. The mixing should begin slowly and speed built up gradually.

Mix carefully until a smooth texture and uniform colour are achieved, which should take approximately 4 minutes. Consideration should always be given to the relevant pot life and kits should not be mixed until they are ready to be used. Additionally, it should be remembered that the mixing action can elevate the temperature of the material, which can also lead to a reduction in pot-life time

Modified Single Leg Airless Spray Equipment

Pump compression ratio: *from 68:1 to 74:1 fitted with check valve to eliminate spray fan fluctuation.*

Air Motor: *Graco Premier (or equivalent) mounted on a power ram with a follower or induction material feed plate.*

- ~18mm (¾") internal diameter fluid line 15 to 20 metres (50 to 65 feet) long, rated to meet the required high pressures of the pump.
- ~12mm (½") internal diameter whip line 4.5 metres (15 feet) long, rated to meet the required high pressures of the pump.
- High pressure airless spray gun fitted with swivel.
- 0.035" to 0.041" "reverse-a-clean" airless spray tips.
- ~18mm (¾") internal diameter x 300 mm (12") long in-line static mixer.

11. HAND/TROWEL APPLICATION

Interchar 212 may also be applied manually using plasterer's trowels. This has the advantage of very little waste and virtually eliminates the need for masking. Special care must be taken during hand trowel applications when coating connection joints that a uniform thickness and required surface finish is achieved (See Appendix 2 Guidance on Surface Finish)

To facilitate application by trowel the Interchar 212 Part A and Part B material should be maintained at a temperature of 21-27ºC (70-80ºF) for a minimum of 24 hours prior to use. Mixing should be carried out as described for single leg airless spray application.

After a kit has been mixed, it may be spread out on flat clean boards or surfaces for each applicator to work with. This prevents the material from curing too quickly and allows sufficient working time. Alternatively the material may be applied directly from the pail.

Often trowel application will require less than a full kit of Interchar 212. In these cases, the required amounts of Parts A and B should be accurately weighed out into a clean container and thoroughly mixed as above. The correct ratio by weight for Interchar 212 is detailed previously in this document.

12. TOPCOATS

Interchar 212 has been extensively tested to industry recognised standards to demonstrate its ability to withstand weather and environmental exposure, both with and without topcoats.

Generally Interchar 212 will be topcoated to meet owners' colour schemes and finish requirements. However, there are specific situations where the use of a topcoat is recommended, these include:

- *To comply with ENV13381 requirements*
- *Area of high UV exposure: like all epoxy products, Interchar 212 will chalk when exposed to high levels of UV for prolonged periods. This can result in fading of the original colour*

It is recommended that Interchar 212 is topcoated when it is sufficiently cured and the surfaces are clean and dry, and before being subjected to any possible surface contamination. For recommended minimum overcoating intervals, please refer to the Technical Data sheet.

Maximum overcoating times are dependent upon environmental exposure, type of topcoat system used and other factors. The topcoat datasheet, the specification and working procedures must also be consulted especially when utilising Interfine polysiloxanes as the maximum overcoat intervals are likely to be shorter than the general ones quoted on the datasheet.

In extreme cases, excessive rolling with solvent can cause amine bloom on the surface of the Interchar 212. This is not acceptable for application of topcoats. Amine bloom formation can be removed by high pressure water-washing at a minimum of 170 bar (2500 psi). Only topcoats approved by International Protective Coatings can be used. Approved topcoats are indicated on the technical data sheet. However this list is not exhaustive and International Protective Coatings can be consulted for enquiries on specific topcoats

For heavy duty protection, International Protective Coatings recommends one of the following topcoat systems:

1. Two coats of Interthane 990 at 50 microns (2 mils) DFT per coat.

2. One coat of epoxy polyamide primer at 50-75 microns (2-3 mils) DFT plus one coat of Interthane 990 or Interfine 878 at 50 microns (2 mils) DFT.

For other service conditions please refer to the Interchar 212 technical data sheet or consult your International Paint representative for topcoat recommendations.

13. REMOVAL AND REPAIR, ADDITIONAL WORK, WELD CUTBACK AND REPAIR OF DAMAGED AREAS

Removal

Interchar 212 can be removed after application for additional work, e.g. welding of attachment, by the use of handheld air driven pistol chisel using a sharp chisel bit of the appropriate width, usually 25 or 50mm. The tool should be used to split the bond between Interchar 212 and the steel, taking care not to gouge or damage the steel substrate.

N.B.: Operators should wear suitable personal protection including but not limited to dust masks and eye protection.

Weld Cutback

For small weld operations, such as addition of clips and hangers, a cutback of 50mm from weld area should be made. For large welds of heavy angle or other members, a cutback of 75mm should be made. Interchar 212 can be removed with a fair degree of accuracy on an identified cut line without damage to surrounding material. After welding has taken place, the surrounding Interchar 212 should show no sign of discolouration or damage. If discolouration, change of applied colour or *'browning'* is seen, then discoloured material should be removed back to sound material.

In the case of allowance of cutback for welding of structural members and structural members themselves which are to be pre-coated with Interchar 212 prior to assembly, the following recommendation is made:

No weld preheat: 300mm either side of weld
Weld preheat: See following table

Preheat (^{o}C)	Duration (hours)	Free Distance (m)
100	4-8	0.75
100	9-12	1.00
150	4-8	0.75-1.00
150	9-12	1.00-1.25

The above figures are expected to be conservative, actual distance is a combination of factors, including mass of steel at weld junction and method of preheat.

As previously noted, discolouration of surrounding material will indicate insufficient cutback or overheating of an area. Interchar 212 will have to be removed and reapplied.

REPAIR OF DAMAGED AREAS

Repair of damaged areas, in the fabrication yard or during service life, and cutback areas should follow the procedure below. Application conditions must conform to specified conditions for primer, topcoat and Interchar 212 application.

1. Check the **'border'** area of surrounding Interchar 212 for soundness and adhesion in the joint area.

2. Mark out the area to be repaired. Masking should be done around the area to be repaired in a square or rectangular shape. This will give the patch a clean appearance once completed

3. Using a disc grinder, cut through the Interchar 212 (take care not to damage substrate).

4. Using chosen tools (hammer and chisel or pneumatic chisel), cut into patch to remove damaged Interchar 212. Make sure all unsatisfactory material is removed.

5. Small areas, for example, welds and local repair areas, may be prepared by power discing with a carborundum disc or by needle gun to achieve a clean, roughened surface in accordance with SSPC-SP11 and maintaining a minimum profile of 50 microns (2 mils). Power tool cleaning should not be used as a **primary** surface preparation method for large areas.

6. Abrade adjacent surfaces for a distance of 150mm (6") from edge of repair area. After roughening, a suitable International Protective Coatings thinner GTA123 (or GTA822) solvent should be used to ensure that the area is clean.

7. Reinstate primer to specification. For repairs, Interchar 212 may also be applied directly to blast cleaned steel.

8. Reinstate Interchar 212 to specification, taking care to smooth over the repair area edges. Trowel application of Interchar 212 is acceptable for repair areas.

9. Topcoat replacement and repair should follow International Protective Coatings' guidelines and topcoat manufacturer's instructions.

14. HEALTH AND SAFETY

Interchar 212 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.). Appropriate Material Safety Data Sheets and local Health & Safety personnel protection requirements must be observed for all materials used.
- 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.
- Refer to local legislation and the manufacturer's specific instructions with regard to equipment safety.
- For the disposal of Interchar 212 refer to local regulations and/or seek the advice of specialist waste disposal providers

Observe all precautionary notices on containers.

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APPENDIX

INTERCHAR 212 - GUIDELINES FOR IMPROVED FINISH QUALITY

Interchar® 212 is used in many infrastructure projects where the quality of finish achieved is important. These guidelines should be used to assist when discussing the surface finish.

As referenced in the Interchar 212 Application Guidelines, a standard of finish should be agreed between client and applicator prior to job start up and a reference sample produced.

As with any application, the aesthetic finish will depend upon many factors including, but not limited to, the following;

- The skill of the applicator
- Equipment used
- Application method used
- Temperature of substrate and location
- Size and shape of steel member (it is more difficult to obtain a good finish standard on smaller steel members, complex designs and circular sections)
- Access to steel members during application

It is recommended that

1) Project specifications, together with the Application Guidelines are followed,

2) Only applicators that are trained in applying epoxy intumescent products should apply Interchar 212.

FINISH STANDARD

It is critical that the spray applied material is of the best achievable finish before any secondary surface finishing is started (i.e. roller, sanding, etc.).

International Protective Coatings has categorized the finish standards into 4 bands. It should however be understood that these are guidelines only and do not in any way mean that International Protective Coatings is responsible for ensuring the finish is acceptable.

FINISH STANDARD NO.1

Standard Finish
Spray Applied

Description: A standard finish is appropriate for non-visible areas, or where surface finish is less important (e.g. elevator shafts, parking garages, etc.). Correct minimum DFT applied, but surface is highly textured (± 5mm (0.2 inches) variation in DFT) and includes surface pinholes and a generally porous appearance. Fibres may be standing up.

Application highlights: This has been applied at a high DFT and has not been rollered correctly to a uniform surface to lay down fibres and peaks. Poor fan pattern and continuous over application will lead to air pockets in the cured film and pinholes on the surface giving a porous appearance.

Comments: Although this standard is acceptable for many epoxy intumescent projects, where the performance of the coating is the important factor, this finish would not normally be up to the standard expected for prominent structures where Interchar 212 is utilised.

FINISH STANDARD NO.2

Normal Decorative Finish
Spray Applied/Back Rollered

Description: Correct minimum DFT applied with a good general standard of cosmetic finish when viewed from a distance of 5m (16' 3") or more. Reasonably uniform texture, with orange peel and similar minor surface defects.

Application highlights: Apply a maximum of 3mm (120 mils) per coat of Interchar 212 as per application manual *(Note: the WFT should be continually checked to ensure the coating is even and the correct thickness).* Immediately after spraying, use a foam roller or solvent dampened short nap (~3mm ($^{1}/_{8}$")) roller to achieve a rollered uniform surface by lightly removing peaks and build up with special attention for areas including flange areas, toes, box stiffeners etc. *(Note: The correct solvent must be used to dampen the short nap roller).* Allow the Interchar 212 to 'gel up' and then apply the next coat as above removing peaks and build up using roller method. 'Gel up' means 'there is no movement of material when touched'. Time to 'gel up' should be 2-3 hours at 15ºC (59ºF) (air/substrate temperature).

Uneven thickness will result in a rippled surface finish and should be avoided. This is often caused by trying to apply too much Interchar 212 per coat (>3 mm (120 mils)).

Comments: This standard should be readily achievable, but the finish may vary depending on the factors mentioned in the background notes

FINISH STANDARD NO.3

High Decorative Finish
Spray Applied/Back Rollered/Sanded

Description: Correct minimum DFT applied with a good general standard of cosmetic finish when viewed from a distance of 2m (6' 6") or more. Minor orange peel, some slight textures and other similar minor defects are apparent.

Application highlights: Apply as per standard No.2, but add an extra 2mm (80 mils) of Interchar 212 to allow for sanding. It is important that a skilled refinishing crew is used to ensure both quality and speed (e.g. a yacht refinishing crew). Once the Interchar 212 is fully cured, sand the surface using orbital sanders initially with 80 grit paper reducing to 120 and finally 220 grit for the final finish.

Comments: The better the sprayed finish the faster the sanded finish will be achieved. Any surface pinholes or **minor** defects can be filled using a filling compound as specified by International Protective Coatings. The percentage of defects must be less than 1.0% and must only be surface imperfections, otherwise the fire protection properties could be compromised.

FINISH STANDARD NO.4

Ultra-Decorative Finish
Spray Applied/Back Rolled/Sanded Smooth

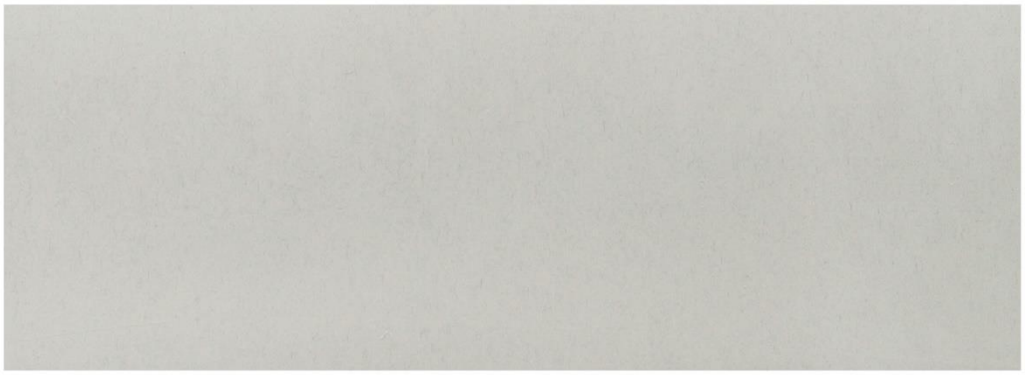
Description: Correct minimum DFT applied with an excellent standard of cosmetic finish when viewed from a distance of 30cm (0.9 feet) or more. No orange peel giving a very smooth finish

Application highlights: Apply as per standard No.2, but add an extra 2mm (80 mils) of Interchar 212 to allow for sanding. It is important that a skilled refinishing crew is used to ensure both quality and speed (e.g. a yacht refinishing crew). Once the Interchar 212 is fully cured, sand the surface using orbital sanders initially with 80 grit paper reducing to 120 and finally 220 grit for the final smooth finish.

(Please note: This finish can also be achieved by casting Interchar 212. Joints and seams for castings must be an equivalent finish to the casting so they are not visible when top coated. Please contact International Protective Coatings to find out about this specialised method)

Comments: Apply as per standard No.3.

(Please note: If castings are the chosen option then additional third party fire testing should be carried out on any casting to test adhesion of the casting to the substrate in a fire. International MUST be contacted and the castings guidelines discussed prior to tendering for any projects using castings).



GENERAL MASKING

Masking tape must be removed prior to Interchar 212 curing. Apply secondary masking tape at termination/free edge area to prevent need for a hammer and chisel to remove masking and save time.

SUMMARY

The appearance of Interchar 212 can be greatly enhanced by using various application techniques; however, the labour costs should be taken into account prior to quoting for a project. International Protective Coatings advises all applicators to conduct their own application trials, so they have a more accurate estimate of costs using their applicators and equipment.