

APPLICATION GUIDELINES

EXTERIOR DECK SYSTEM

Intershield® 9L & Intershield® 9G

Revision 8

Issue Date: 15th September 2015





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1. SCOPE AND PURPOSE

The purpose of these guidelines is to ensure that the coating system, as applied, provides adequate protection against mechanical damage and corrosion.

Successful in-service performance of a deck coating system depends upon both the correct choice of coating and the adoption of the correct procedures 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 and Shipyard. Under no circumstances do these responsibilities rest with International Paint. If International Paint provide for the presence of a Technical Service Representative, their role is advisory only unless otherwise specified.



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2. PRODUCT SPECIFICATION AND PRODUCT CURE GRAPHS

2.1 SURFACE PREPARATION

2.1.1 New Installation

All surface preparation shall include at least 2-3 inches (50-75mm) up on all bulkheads, coamings, pipes and other vertical surfaces.

Paint only clean, dry surfaces. Remove all salts, grease, oil, soluble contaminants and other detrimental foreign matter by "solvent cleaning" (SSPC-SP1).

Steel: For optimum performance blast to ISO Standard 8501-1 (2007) - Sa2¹/₂. The equivalent in the USA is "Near White Blast Cleaning" (SSPC-SP10).

Alternatively, water jet to International Paint Hydroblasting Standard HB2½ with flash rusting no worse than HB2½L. See Section 5.5 for equivalent Water Jetting standards.

A minimum surface profile of 3 mils (75 microns) is required.

Aluminum: For aluminum and light alloys the surface should be solvent cleaned according to SSPC-SP1 then physically etched by abrasive blasting using a non-metallic abrasive.

For inaccessible areas, or areas where blasting is impractical, power tool clean to ISO Standard 8501-1 (2007) - St3 (SSPC-SP11) as specified.

2.1.2 Repair

All surface preparation shall include at least 2-3 inches (50-75mm) up on all bulkheads, coamings, pipes and other vertical surfaces.

Paint only clean, dry surfaces. Remove all salts, grease, oil, soluble contaminants and other detrimental foreign matter by "solvent cleaning" (SSPC-SP1).

Reskid (over Intershield 486): For maximum system performance, the complete removal of nonskid coating from Intershield 486 is recommended and may be accomplished by sanding, grinding, abrasive blasting or water jetting.

For fibreglass or wooden substrates please consult International Paint.

Remove all dust and abrasive from the surface prior to coating. Coat before corrosion or contamination occurs. Care must be taken not to contaminate the properly prepared surfaces.





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2.2 **SPECIFICATION**

2.2.1 Landing Areas

Product	Alternative		Dft (mils)		Dft (microns)			
			Spec	Min	Max	Spec	Min	Max
Intershield 486	Consult Paint	International	5	4	7	125	100	175
Intershield 9L			N/A			N/A		

2.2.2 General Areas

Product	Product Alternative		Dft (mils)			Dft (microns)		
			Spec	Min	Max	Spec	Min	Max
Intershield 486	Consult Paint	International	5	4	7	125	100	175
Intershield 9G or Intershield 9L			N/A			N/A		

2.3 NOTES

2.3.1 Intershield 9L and Intershield 9G are non-skid coatings and, as such, it is not possible to accurately measure wet film thickness. This product should therefore be applied to give the following coverage:

Intershield 9L and Intershield 9G (by roller): 20 - 30 sq.ft./gal (0.50 - 0.74 sq.m/litre)

It is vitally important to avoid over-application (see section 5.7).

- 2.3.2 Refer to the accompanying graphs for recommended overcoating intervals, pot life and curing requirements.
- 2.3.3 The drying times quoted refer to a single coat applied to give the specified dry film thickness in the table above. At higher film thicknesses drying times may be extended, particularly at low temperatures.
- 2.3.4 All thicknesses are to be checked by the Contractor Quality Control Department and by the International Paint Technical Service Representative (if present) on site. Any substandard areas are to be rectified.
- 2.3.5 For the application of Intershield 486 the steel temperature must not be lower than 32°F (0°C) or exceed 73°F (23°C). For the application of Intershield 9L and Intershield 9G, the deck temperature must not be lower than 32°F (0°C) or exceed 80°F (26.7°C). For maximum performance, the curing temperature should be above 32°F (0°C).
- 2.3.6 Interthane 990 may be used for colour marking purposes.

2.4 PRODUCT CURE GRAPHS

- 2.4.1 Pot Life
- 2.4.2 Touch Dry Times
- 2.4.3 Hard Dry Times
- 2.4.4 Dry to Service Times
- 2.4.5 Minimum Overcoating Intervals
- 2.4.6 Maximum Overcoating Intervals

Marine Coatings

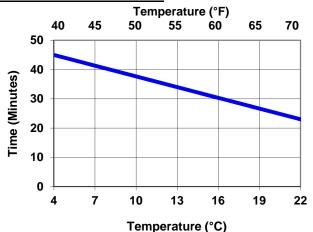
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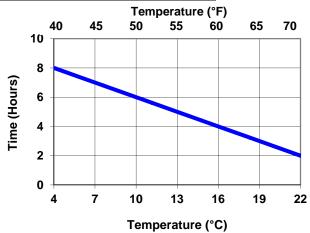


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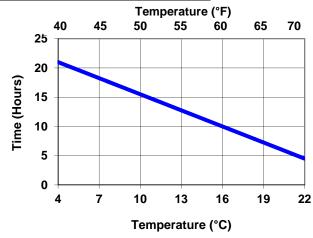
INTERSHIELD 486: Pot Life



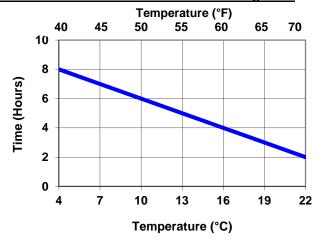
INTERSHIELD 486: Touch Dry Time



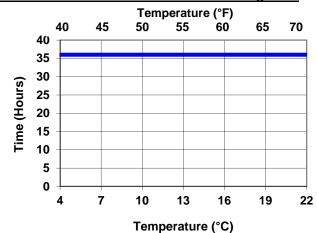
INTERSHIELD 486: Hard Dry Time



INTERSHIELD 486: Minimum Overcoating Time

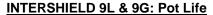


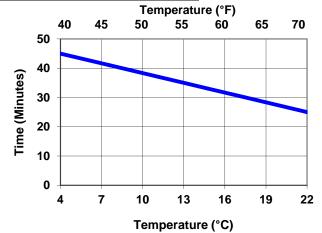
INTERSHIELD 486: Maximum Overcoating Time



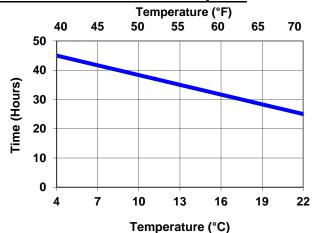


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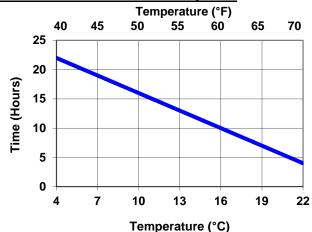




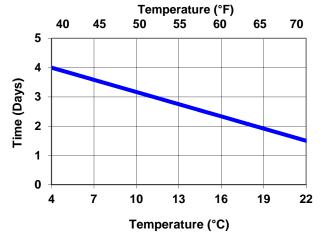
INTERSHIELD 9L & 9G: Touch Dry Time



INTERSHIELD 9L & 9G: Hard Dry Time



INTERSHIELD 9L & 9G: Time to Service





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3. COATING APPLICATION PROCEDURES

3.1 NEW INSTALLATION

- 3.1.1 Prepare all surfaces to be coated to the standard detailed in section 2.1 of this procedure.
- 3.1.2 Upon completion of the surface preparation, and after inspection by the Contractor Quality Control Department, the International Paint Technical Service Representative (if present) will also inspect the whole area and mark up any substandard areas.
- 3.1.3 Remove all dust and abrasive from the surface prior to coating. Coat before corrosion or contamination occurs. Care must be taken not to contaminate the properly prepared surfaces.
- 3.1.4 Thoroughly mask any areas to which the Intershield Exterior Deck System is not to be applied, e.g. hatches and deck drains.
- 3.1.5 Apply a stripe coat of Intershield 486 to weld seams to the specified film thickness.
- 3.1.6 Apply a full coat of Intershield 486, or an alternative primer if specified, to the specified film thickness. Apply up 2-3 inches (50-75mm) on all vertical surfaces. When applying over a stripe coat, full coat may be applied while the stripe coat is still tacky.
- 3.1.7 Allow to dry for 12-24 hours (depending upon temperature see hard dry time graph in section 2.4) before inspecting the applied coating and checking the dry film thickness.
- 3.1.8 Apply a full coat of Intershield 9L (or Intershield 9G) at the specified coverage rate. See section 5.7 for application method. Note that thick, carelessly applied coats will result in minimum coverage and be subject to mud-cracking and/or blistering.
- 3.1.9 When hard dry, inspect the surface profile of the applied coating.
- 3.1.10 Once the full system has been applied, and has been accepted by the Contractor Quality Control Department, the International Paint Technical Service Representative (if present) will check the dry film.
- 3.1.11 Ensure that the completed deck area is kept free of all traffic until the coated areas have fully cured.
- 3.1.12 Remove all masking.

3.2 REPAIR

- 3.2.1 Prepare the surface to be repaired according to the guidelines given in section 2.1 (Reskid over Intershield 486) of this procedure.
- 3.2.2 When the area to be repaired is clean and dry, apply a full coat of Intershield 9L (or Intershield 9G) to the specified film thickness. See section 5.7 for application method. Note that thick, carelessly applied coats will result in minimum coverage and be subject to mud-cracking and/or blistering.
- 3.2.3 To complete repairs, continue to 3.1.9 of the **New Installation** application procedure.





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4. TECHNICAL INSPECTION AND PROJECT CONTROL

Project control by regular inspection and agreement on future action is vital to successful Intershield deck coating projects, and in maximising the potential of a coating system.

All parties involved in the deck coating work must agree an inspection procedure prior to work commencing, this should outline how and when both work and inspection will be undertaken.

Prior to commencing the project the contractor(s) must be provided with copies of the relevant product data sheets. Attention should be drawn to pack sizes, mix ratios, thinning restrictions etc.

The International Paint Technical Service Representative (if present) should supervise initial mixing of the first drums of product to be applied to ensure that all parties are aware of mixing and application characteristics.

Daily meetings should be arranged to confirm performance of the work and inspection schedules, minutes of these meetings must be taken and circulated to all participants. Representatives of the contractor, shipyard and ship owner would normally be present at these meetings.

In the event of work continuing at any stage without the approval of International Paint, the Company cannot be held responsible for any subsequent failure of the deck coating system on the areas concerned. Such an event is termed an EXCEPTION. All parties MUST be officially informed in writing using the standard Exception Report Form immediately following the occurrence.

International Paint, and any other authorised personnel, may inspect any stage in the process.

Contractors must supply interpreters if necessary.

On completion of the project all relevant documentation must be retained, and safely archived, by the Local Technical Service Manager.

Inspection equipment for measurement of profile depth, humidity, wet and dry film thickness, etc should be of approved types and should be within calibration limits.

NOTE: When measuring the dry film thickness of coatings, the d.f.t. gauge must be calibrated prior to use as follows:

- 1. Check that the probe is clean.
- 2. Place the probe on a sample of millscale-free smooth steel of thickness greater than 1mm.
- 3. Calibrate the instrument to zero.
- 4. Select a certified shim of similar thickness to that expected for the coating under test.
- Calibrate the gauge to the shim thickness.
- 6. Check that the gauge reads zero when replaced on the smooth steel sample.

Measurement of dry film thickness is described in ISO Standard 2808:2007 and in ASTM D7091:2005.





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5. GENERAL NOTES

5.1 **DECK CONDITION**

5.1.1 **New Installation**

Prior to commencement of gritblasting or water jetting it is essential that the deck is clean, dry, and in a condition suitable for surface preparation and application of the deck coating. The following briefly outlines the minimum requirements:

All grease and oil must be removed from all surfaces.

Defective steelwork, prior to project commencement, should be repaired in line with the guidance notes given in 5.2 (Steelwork Preparation).

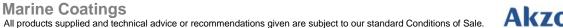
5.1.2 Repair

Prior to the commencement of blasting it is essential that the deck is clean, dry, and in a condition suitable for surface preparation and application of the deck coating. The following briefly outlines the minimum requirements:

Heavy scale must be removed from all surfaces.

All grease and oil must be removed from all surfaces.

Any areas of steel renewal should be prepared in the manner described in 5.2 Steelwork Preparation.







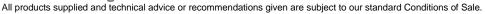
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5.2 STEELWORK PREPARATION

Preparation grades of welds, cut edges and surface imperfections are described in ISO 8501-3. Preparation to P3 grade of this standard will provide surfaces which will ensure optimum paint performance. International Paint recommend the following methods and minimum levels of preparation on any new steelwork:

ITEM	PROBLEM / SOLUTION
Sharp Edge	Remove sharp edges or gas cutting edges with grinder or disc sander:
Weld Spatter	1. Remove spatter observed before blasting by grinder, chipping hammer etc. 2. For spatter observed after blasting: a) Remove with chipping hammer /scraper etc. b) Where spatter is sharp, use disc sander or grinder until obtuse c) Obtuse spatter – no treatment required (a) (b) (b) (c) (c) (d) (e) (f) (f) (f) (f) (g) (h) (h)
Plate Lamination	Any lamination to be removed by grinder or disc sander
Undercut	Where undercut is to a depth exceeding 1mm and a width smaller than the depth, repair by welding or grinding may be necessary
Manual Weld	For welding bead with surface irregularity or with excessive sharp edges, remove by disc sander or grinder
Gas Cut Surface	For surfaces of excessive irregularity, remove by disc sander or grinder









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5.3 STORAGE (AT POINT OF APPLICATION)

The paint must be stored out of direct sunlight so that the temperature of the material will not exceed 70-80°F (21-27°C) for prolonged periods of time.

In winter months, when temperatures can be expected to fall below 50°F (10°C), base and curing agent must be stored in premises, (storeroom, hut, etc), which are heated to a temperature of 70-80°F (21-27°C) for a period of not less than 48 hours immediately prior to use (unless stated otherwise on the product technical data sheet).

5.4 **GRIT BLASTING**

5.4.1 **General**

Two main universal standards of surface preparation are normally specified for deck coatings - ISO Standard ISO 8501-1 (2007) - Sa2 and Sa21/2.

In general, the following comments apply to these standards.

Sa2 - the resulting steel surface should be free from most of the rust, old coating and foreign matter. Any residual old coating should be firmly adhering

Sa2½ - in practice, this is considered to be the best standard a skilled blasting operative can consistently achieve.

Comparative Standards

ISO 8501-1: 2007	Japanese Standard on new steel	SSPC Standard		
Sa2	Not applicable	SSPC-SP6		
Sa21/2	JA SH2	SSPC-SP10		

In cases where the substrate is corroded or pitted, it may be necessary to fresh water wash the areas after abrasive blasting, then re-blast, in order to ensure complete removal of soluble corrosion products.

5.4.2 Compressed Air

Air used for blasting must be clean, oil free and dry. The pressure should be at least 7kg/cm² (100lb/sq inch) at the nozzle.

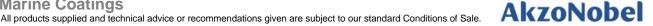
5.4.3 **Abrasive**

Abrasives used for blasting must be dry and free from dirt, oil, grease and suitable for producing the standard of cleanliness and profile specified. The abrasive must therefore be in accordance with the specifications given in ISO 11126 - Parts 1 to 8 and each delivery should carry a certificate of conformity to this specification.

If blasting abrasive is supplied on site without a certificate of conformity, the material should be tested by the yard or contractor in accordance with the methods given in ISO 11127 -Parts 1 to 7.

Particular attention should be given to ISO 11127 - Part 6, where the level of water soluble contaminants must not give a conductivity value greater than 25mS/m, and ISO 11127 - Part 7, where the level of water soluble chlorides must not exceed 0.0025% by weight.







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ASTM D4940-89(94) also provides a method for quantifying the level of water-soluble ionic contaminants. This standard does not provide limits of acceptability for blasting abrasive but does give a typical value for a low level of contamination as 50 µmho/cm.

Iron or steel abrasives can be used for in-situ open blasting. Specifications for metallic abrasives are given in ISO 11124 - Parts 1 to 4 and the corresponding test methods in ISO 11125 - Parts 1 to 7. If used, careful and thorough cleaning must be carried out at all stages of the operation to ensure that no abrasive remains in the tank as this may subsequently corrode.

Although not recommended, recycled grit may be used providing it is dry, has been shown to be free from contamination by dirt, oil, grease, and has been tested in accordance with the above ISO standards.

5.4.4 Blast Profile

The amplitude of the blast profile depends upon the type of coating to be applied, measurement on site should be by profile gauge or other instruments mutually acceptable.

Measurement of surface profile using comparators is described in ISO 8503-2. The comparators themselves are described in ISO 8503-1. A medium 'G' type comparator should be used and a value of 75-112 microns (3.0-4.5 mils) is acceptable when measured by:

- a) ISO 8503-3: Focusing microscope
- b) ISO 8503-4: Stylus

When using a needle gauge such as the Elcometer 123, a value of 100 microns (3.94 mils), taking a maximum of 10 determinations, is ideal.

For projects taking place in the USA:

- Measurement of surface profile using comparators is described in ASTM D4417 Method
- Measurement of surface profile using a needle gauge is described in ASTM D4417 Method B
- Measurement of surface profile using replica tape is described in ASTM D4417 Method C and NACE RP0287-91





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5.5 WATER JETTING (HYDROBLASTING)

Only fresh water is to be used for water jetting. Salt water is unacceptable for substrate preparation. Chemical corrosion inhibitors must <u>not</u> be added to blasting water. See note 5.6 of the International Paint Hydroblasting Standards. In order to achieve acceptable residual salt levels, water of a conductivity of no greater than 400 microSiemens should be used.

All areas are to be water jetted to a minimum standard of HB2½ 'Very Thorough Hydroblast Cleaning' from International Paint Hydroblasting Standards. This states:

"When viewed without magnification, the surface shall be free from visible oil, grease, dirt and from most of the rust, paint coatings and foreign matter. Any remaining contamination and staining shall be firmly adhered. See notes 5.9 and 5.10".

A test area will be water jetted before the main tank, and inspected before flash rusting has occurred; see note 5.3 of the International Paint Hydroblasting Standards. Agreement will be reached by the Owner's representative, the International Paint representative (if present) and the Contractor's representative on the agreed standard before the main tank area is water jetted.

For areas difficult to water jet, it is advisable to mechanically clean to St3 standard of ISO 8501-1 (2007) (SSPC-SP11) after water jetting.

Rust, scale and old paint debris must be removed from the deck prior to inspection and mark up by the Contractor's Quality Control Department. The International Paint representative (if present) will then inspect the whole area and mark up any substandard areas.

All marked areas shall be rejetted and brought up to the required standard.

If flash rusting is too heavy, it can be removed by high-pressure washing. Upon drying, the surface must have an acceptable level of flash rusting for overcoating. See note 5.7 from the International Paint Hydroblasting Standards.

Comparative Standards

International Paint		NACE No. 5/
Hydroblasting Standard	ISO 8501-4 (2006)	SSPC-SP 12
HB2	Wa2	WJ-3
HB2½	Wa2½	WJ-2

Three flash rust grades, designated L, M, and H are specified in each of the above standards.

5.6 **CLEANING**

Prior to initial blasting inspection, the bulk of spent grit (and old paint debris if applicable) must be removed from the deck area to be coated. When preparing surfaces by other means, e.g. water jetting, all traces of debris should be removed.

Any substandard areas should be identified and must be brought up to the specified standard.

All marking paint, chalk, etc, used to identify substandard areas must be removed after substandard areas are rectified. If marking pens are used which cannot be removed then they must be technically approved by Worldwide Marine Laboratories prior to any overcoating taking place.

Final approval of a substrate for coating application must be confirmed after final cleaning.

It is recommended that all personnel working on the prepared decks wear overshoes.









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5.7 PAINT APPLICATION

Efficient mechanical stirrers for the correct mixing of paint must be used.

Available air pressure and capacity for spray equipment should be at least 80 psi and 50 cfm (5.5kg/cm² and 1.4m³/min).

All spray equipment must be in good working order and be capable of performing to the output requirements defined in International's product technical data sheets.

Tips should be the size stipulated on the product technical data sheet. Tips must not be in a worn condition.

Specific paint application considerations for the Intershield 9L & 9G Exterior Deck System are as follows:

5.7.1 <u>Intershield 486</u>

For airless spray, a minimum 56:1 ratio pump should be used. The spray tip should be of orifice 0.017-0.023 inch (0.432 - 0.584mm).

A china bristle brush is recommended for brush application.

When applying by roller, use an All Purpose Roller Cover over 3/8 inch (9.5mm) pile, smooth to medium. Prewash the roller cover prior to use to remove loose fibres.

5.7.2 Intershield 9L & Intershield 9G

These products must be applied with a long handled paint roller equipped with a smooth phenolic core roller cover. It is recommended that rollering should take place in one direction, with approximately 3 inches (7.5 cm) overlap onto the previously applied adjacent strip. Apply firm downward pressure on the roller during application. When applying over welds, roll across the welds, <u>not along them</u>, in both directions to ensure even coverage. For flight decks, any ridges should run bow to stern such that aircraft tyres run along the ridges and avoid contact with pooled water or spilled lubricants.

When the coating has been properly applied, the surface profile will present a uniformly rough appearance over the entire surface. There will be no loosely bound clumps of particles. The surface profile will show a pattern of hard raised peaks or ridges similar to a 'plowed-field'. The peaks of the ridges will be about 0.5-1.0 inch (12.5 - 25.0 mm) apart and approximately 1/16 to 3/32 inch (1.5 - 2.4 mm) high. The non-skid coating, at its thinnest point, should be at least 30 mils (762 microns) dry film thickness. It is not possible to check either wet or dry film thickness of this material due to its uneven surface. An even thickness can be obtained using volume area control. Consult International Paint.

Intershield 9L and Intershield 9G must be applied in a tight, thin coat to provide the resiliency required. Thick, carelessly applied coats will result in minimum coverage and be subject to mud-cracking and/or blistering.





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6. HEALTH & SAFETY

6.1 INTRODUCTION

Some coatings contain volatile flammable organic solvents which can form explosive mixtures with air. Definite safety precautions must be taken whilst applying this type of coating. Detailed attention must be given to the following points:

- Danger of explosion or fire.
- Provision of a suitable breathing environment for workers.
- Prevention of skin irritation problems.

6.2 DANGER OF EXPLOSION OR FIRE

The key factor in preventing an explosion or fire, when considering the application of coatings in open air is elimination of naked flames, sparks and any ignition sources.

Welding, cutting or grinding in the vicinity of paint application should be forbidden until paint fumes are totally dispersed.

Smoking must be prohibited in the vicinity of paint application.

Airless spray equipment must be earthed (because of the danger of static electricity build-up).

Mobile telephones and electrical cameras <u>must not</u> be used in the vicinity of paint application until paint fumes are totally dispersed.

6.3 SOLVENT VAPOUR AND PAINT MISTS - PROTECTION OF PAINTING PERSONNEL

Painters must wear protective clothing, e.g. overalls, gloves, and suitable footwear of non-spark type.

6.4 **SKIN IRRITATION**

If the correct protective clothing has been worn, e.g. overalls, gloves, air fed hood etc, no discomfort should be experienced from skin irritation. Any small areas not protected by clothing, e.g. wrists or neck, can be treated with a non-greasy barrier cream. (Petroleum jelly is not recommended as this can assist the transport of solvents into the skin).

Any areas of skin accidentally contaminated with paint must be thoroughly washed with soap and water. A skin conditioner that is designed to replace the natural oils in the skin can be used.

Note

- 1. The preceding safety information is given for guidance only.
- 2. It is imperative that, prior to the commencement of any hold coating project, local Regulations regarding Health and Safety be consulted.
- Consult the relevant Product Health & Safety Data Sheets prior to use.





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