International Marine Coatings

PRODUCT TECHNICAL PROFILE

Intergard® 740 Epoxy Finish

Revision 08
29/09/2008

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1. Product Description

Intergard 740 is a two-component, polyamide cured epoxy coating, available in a wide range of colours via Chromascan. Intergard 740 provides a hardwearing surface and offers extended recoatability.

2. Intended Uses

Intergard 740 is intended as a cosmetic finish for use on internal and external vessel areas above the waterline at temperatures down to 5°C (41°F).

For use at Newbuilding, Maintenance & Repair or On Board Maintenance.

3. Regional Variations

In Korea, a fatty acid modified version of Intergard 740 is supplied at Newbuilding and can be applied at dry film thicknesses up to 125 microns. This modification improves weatherability in terms of resistance to chalking but also results in poorer solvent resistance and higher cost. The modification also reduces yellowing on atmospheric exposure but this improvement is not seen in engine rooms or other areas where Intergard 740 is subjected to high temperatures.

4. Health & Safety

Intergard 740 contains solid epoxy and polyamide resins. As a result, there is a slight potential for skin irritancy and/or sensitisation due to prolonged skin contact. The use of appropriate personal protective equipment (PPE) is recommended, as detailed on the material safety data sheets. As with all solvent containing coatings, the appropriate level of ventilation should be employed to ensure that levels of vapours, mists and particulates present in the atmosphere are kept below the Occupational Exposure Limits (OEL).

Refer to the Application H&S document for two-component epoxies, available via the Technical Operations section of the Marine Intranet site, and to the relevant material safety data sheet.

5. Features & Benefits

Feature	Benefit
• Hardwearing epoxy formulation	• Good resistance to mechanical damage and to chemical / solvent spillage.
• Extended recoatability	• Easy, cost-effective maintenance.
• Isocyanate-free	• Health & safety for the applicator.
• >3000 vessel track record since 1992 (>3 million litres)	• Proven in service performance

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6. Surface Preparation

6.1 Newbuilding and Major Refurbishment

Intergard 740 should always be applied over a recommended primer coating scheme (see section 7). The primer surface should be dry and free from all contamination, and Intergard 740 must be applied within the overcoating intervals specified (consult the relevant product data sheet or section 12 of this document).

Areas of breakdown, damage etc. should be prepared to the specified standard and primed prior to the application of Intergard 740.

At newbuilding, if applying Intergard 740 in two coats with an extended break between coats (> 3 months), the underlying coat should be fresh water washed and abraded prior to application of the second coat.

6.2 Repair and On Board Maintenance (exposed steel and corrosion)

Intergard 740 should always be applied over a recommended primer coating scheme (see section 7). The primer surface should be dry and free from all contamination, and Intergard 740 must be applied within the overcoating intervals specified (consult the relevant product data sheet or section 12 of this document).

Areas of breakdown, damage etc. should be prepared to the specified standard and primed prior to the application of Intergard 740.

6.3 Repair and On Board Maintenance (over intact coatings)

Intergard 740 may be applied directly over aged epoxies (including self) and polyurethanes following thorough fresh water washing and degreasing, provided the coating to be overcoated is in an intact and tightly adherent condition. Loose or flaking coatings should be removed back to a firm edge and Intergard 740 or an appropriate primer should be used to repair the area before application of the full coat.

7. Primers

Intergard 740 should only be applied over epoxy anticorrosive primers. The primer to be used will depend upon vessel area and application location. Typical primers include:

Interbond 201
Intergard 264
Intergard 269 (as a tiecoat over Interzinc 22 on external decks)
Intergard 400
Intershield 300
Intershield 803
Intertuf 262
Intertuf 362

Intergard 740 can also be applied over Intergard 343 and Intergard 787 primers in Korea. Refer to the appropriate product data sheets or contact your local Regional Technical Director, or Technical Centre, for further details.

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8. Application

8.1 Mixing

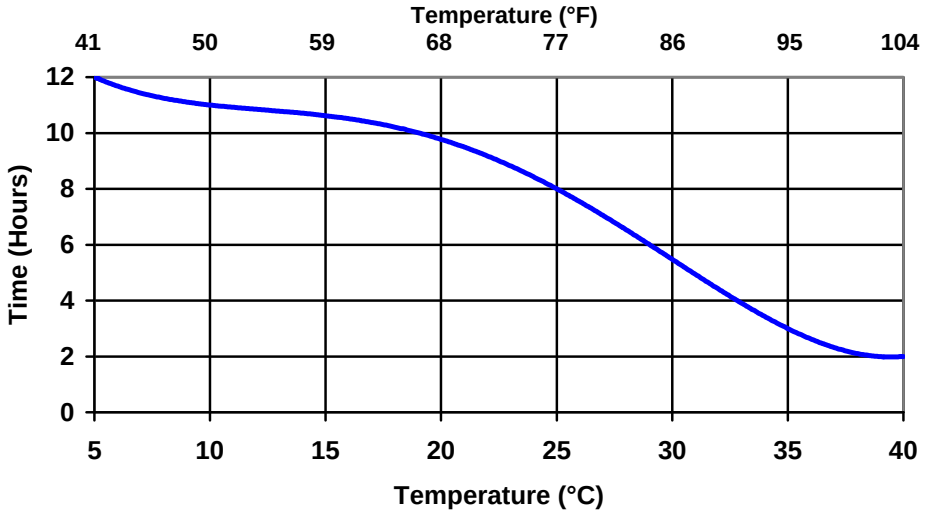
Intergard 740 is supplied as a two component material comprising of a pigmented base and a clear dark coloured curing agent. Some settlement of the base component may be observed after prolonged periods of storage, or when the product has been stored at elevated temperatures. The base component should be thoroughly mixed with a power agitator prior to being combined with the curing agent until the mixture is homogeneous.

8.2 Thinning

Under normal conditions, thinning of Intergard 740 should not be necessary to obtain good airless spray application properties. Under exceptional circumstances, thin with International GTA220 to a maximum of 5% by volume. Do not thin more than allowed under local environmental legislation.

If too high a level of thinner is used, hold-up will be reduced and the necessary film thickness and opacity may not be obtainable.

8.3 Working Pot Life



8.4 Spray Application

Airless spray is the preferred method of application for Intergard 740. Application by brush or roller should only be used for small areas and multiple coats may be required to achieve the specified film thickness.

Airless spray tip range: 0.38 – 0.53mm (15 – 21 thou)
Total output fluid pressure at spray tip: not less than 176 kg/cm^2 (2500 p.s.i.)

Available air pressure and capacity for spray equipment should be at least 5.5kg/cm^2 and 1.4m^3/min (80 psi and 50 cfm).

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8.5 Environmental Conditions for Application

Minimum air temperature:	+5°C (41°F)
Minimum steel temperature:	5°C (41°F), and must be 3ºC (5ºF) above dew point
Maximum relative humidity:	85%

9. Dry Film Thickness

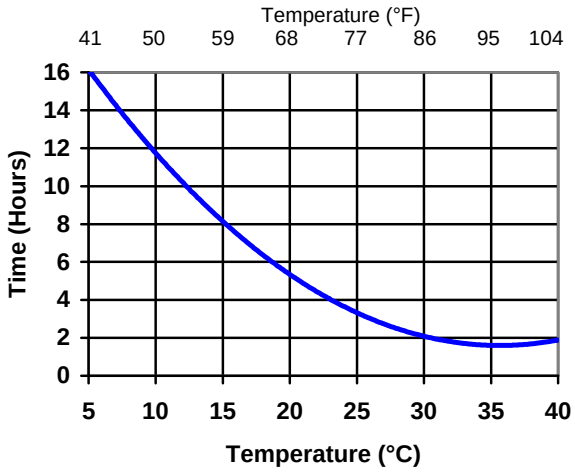
Intergard 740 is typically applied at 50 microns (2 mils) dry film thickness, equivalent to 98 microns (3.9 mils) wet film thickness.

Depending upon the colour of Intergard 740 being applied, and also the colour of the underlying primer, it may be necessary to apply two coats to achieve the desired opacity.

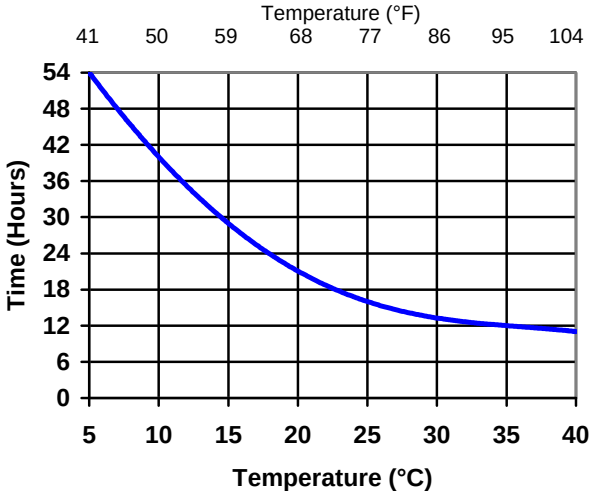
10. Drying Times

The drying times quoted refer to a single coat applied to give 50 microns (2 mils) dry film thickness and have been determined under laboratory-controlled conditions. Drying times achieved in practice may show slight fluctuations.

Touch Dry



Hard Dry



Note: Drying times are shorter in Japan/Korea. Please refer to local datasheets. **Click Here**

11. Curing

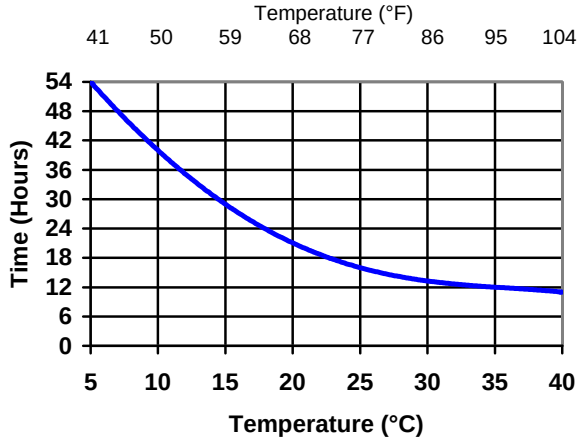
Intergard 740 cures by a crosslinking reaction between the epoxy and polyamide resins. No catalyst is included in the formulation and the epoxy/polyamide reaction will not proceed at an adequate rate to provide cure below 5°C (41°F). A tougher film, with improved resistance to chemical or solvent spillages and mechanical damage will be obtained if the cure temperature is above 10°C (50°F).

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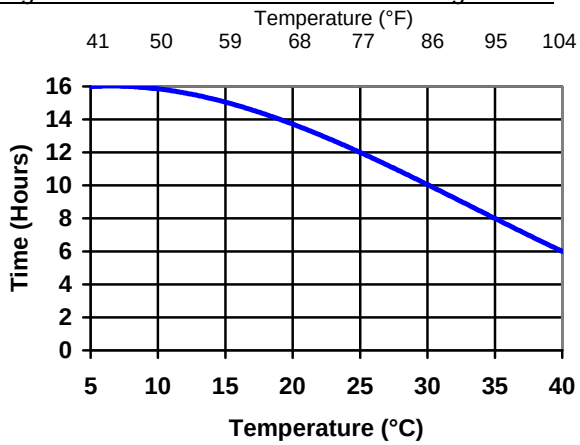
12. Overcoating

Intergard 740: Minimum Interval over Self

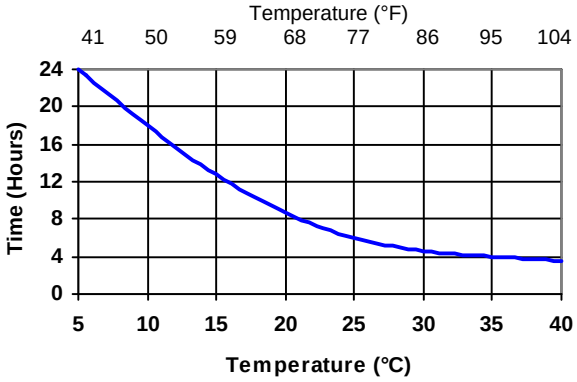


Note: The minimum overcoating intervals for Intergard 740 with self are shorter in Jpan/Korea. Please refer to local datasheets. **Click Here**

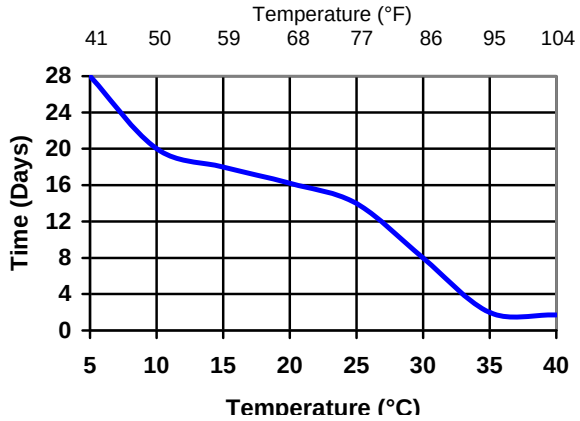
Intergard 740: Minimum Interval over Intergard 400



Intergard 740: Minimum Interval over Interbond 201 Temperate & Intertuf 262.



Intergard 740: Maximum Interval over Interbond 201 Temperate & Intertuf 262.



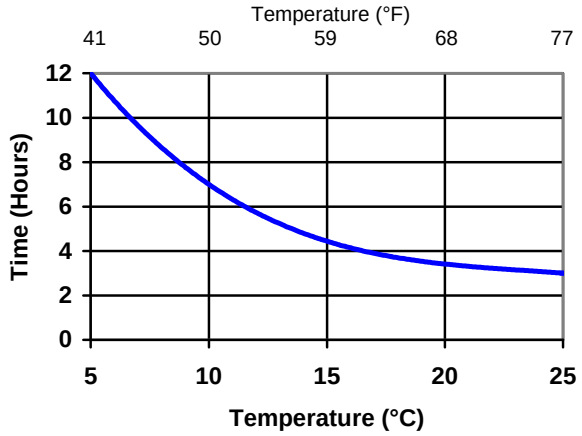
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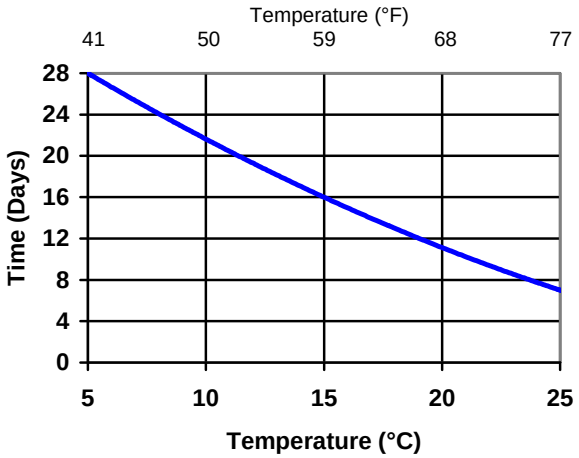
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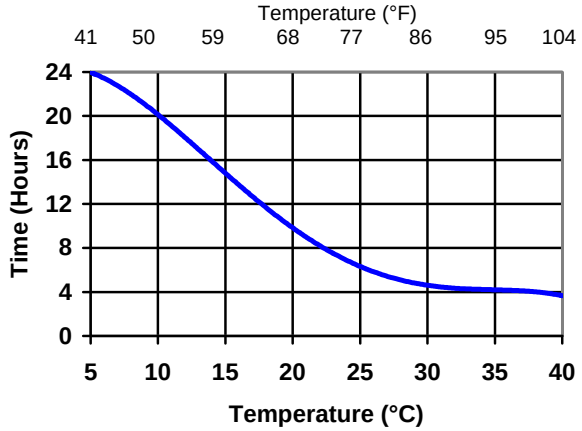
Intergard 740: Minimum Interval over Interbond 201LT



Intergard 740: Maximum Interval over Interbond 201LT



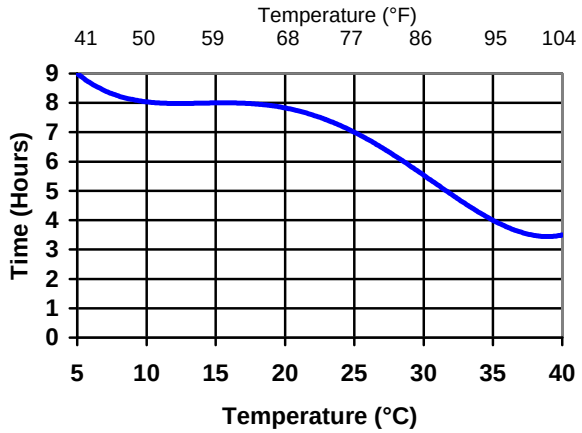
Intergard 740: Minimum Interval over Intergard 269



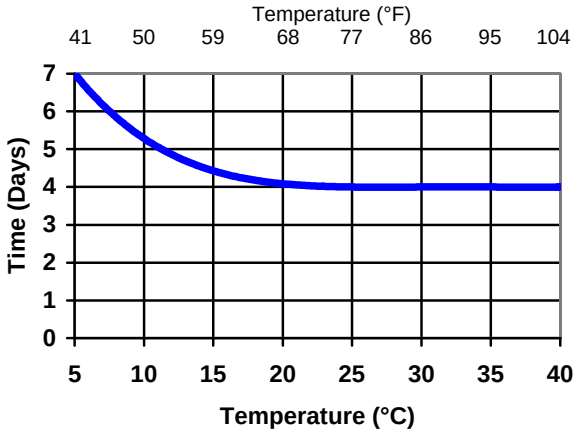
Intergard 740: Maximum Interval over Intergard 269

Intergard 740 may be applied over Intergard 269 for an indefinite period, providing that the surface to be overcoated is intact, clean, dry and free from all contaminants.

Intergard 740: Minimum Interval over Intershield 300



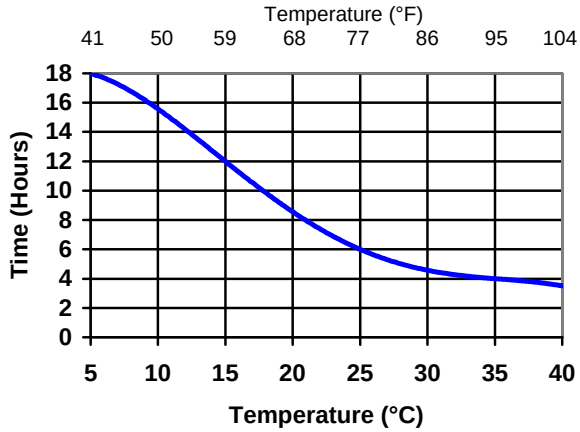
Intergard 740: Maximum Interval over Intershield 300



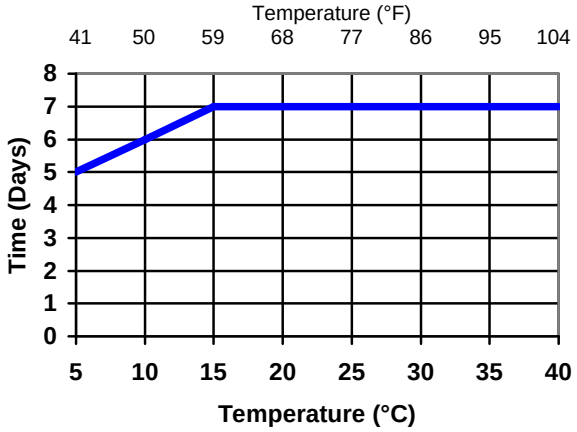
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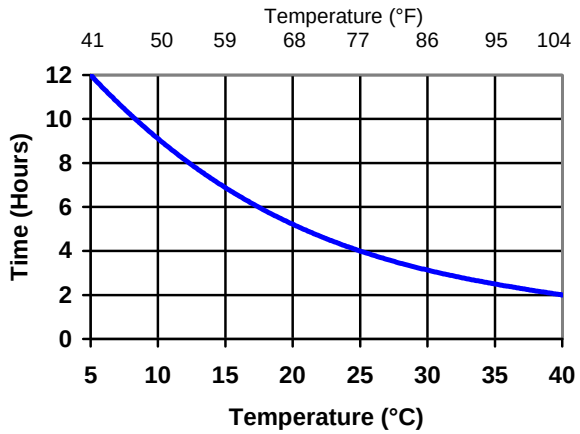
Intergard 740: Minimum Interval over Intershield 803



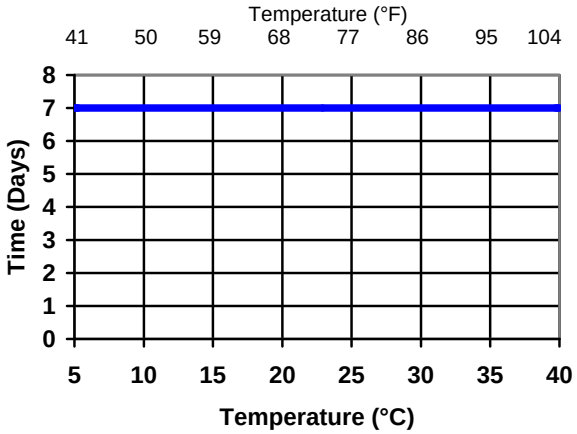
Intergard 740: Maximum Interval over Intershield 803



Intergard 740: Minimum Interval over Intertuf 362



Intergard 740: Maximum Interval over Intertuf 362



Overcoating notes:

Intergard 740 may be applied over self, Intergard 400 and Intergard 269 for an indefinite period, providing that the surface to be overcoated is intact, clean, dry and free from all contaminants.

13. Storage Stability

There are no significant problems envisaged, provided both components are stored in dry, shaded conditions away from sources of heat and ignition. Both components are stable and have quoted shelf lives of 12 months minimum at temperatures up to 25°C (77°F).

Over a period of time, particularly at high temperatures, the epoxy resin in Part A can react with alcoholic solvents, reducing epoxy functionality. The effect of this is to reduce hold-up of Intergard 740 when applied and also to reduce chemical resistance. For this reason, it is important to avoid storage in direct sunlight, or in locations where temperatures may exceed 25°C (77°F).

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14. Cosmetic Performance

Most conventional epoxy finishes, including Intergard 740, have relatively good initial gloss levels but, on exposure to sunlight, the coating surface is degraded by the action of Ultra Violet light. This results in a powdery surface with little gloss and the effect is known a “chalking”. It is therefore important that customers are made aware that Intergard 740, when exposed to sunlight, will not offer as good gloss or colour retention as cosmetic finishes of other generic types, such as polyurethanes or acrylics. For further details, refer to Worldwide Marine bulletin 208.



Badly chalked red epoxy finish

The modified version of Intergard 740 manufactured in Korea (see section 3) possesses improved cosmetic properties compared to the standard version but will still chalk, albeit to a lesser extent.

If Intergard 740 is exposed to water, or moisture from the air, lying or condensing on the surface of the coating during cure, “water spotting” can occur. This is characterized by a white haze or blush on the surface and, although not affecting adhesion of subsequent coats, leads to unacceptable cosmetic appearance. In order to prevent water spotting, it is important that application of Intergard 740 should not take place just before, or during, rain or snow or in conditions of high humidity or fog. Application at low temperatures exacerbates these effects. Care should also be taken to avoid application late in the day, when temperature drop overnight may result in condensation.

If water spotting does occur, cosmetic appearance can be improved by solvent washing to remove the surface defect.

The following table gives a comparison of properties of various types of cosmetic finish:

	Polysiloxane	Epoxy	Polyurethane	Acrylic (1-pack)	Acrylic (2-pack)	Alkyd
	Interfine 979	Intergard 740	Interthane 990	Intersheen 579	Interfine 691	Interlac 665
Resistance to mechanical damage	Good	Good	Fair	Poor	Fair	Poor
Resistance to solvent/chemical spillage	Good	Good	Good	Poor	Good	Poor
Resistance to chalking	Excellent	Poor	Very good	Good	Very good	Fair
Initial gloss	Excellent	Good	Excellent	Good	Very good	Very good
Gloss retention	Excellent	Poor	Very good	Good	Very good	Fair
Ease of cleaning	Excellent	Fair	Very good	Fair	Very good	Good

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15. Chemical Splash Resistance

Coatings applied to exterior decks, and to floors in store rooms etc., can come into contact with chemicals, due to splashing or spillage. Intergard 740 is resistant to many of these chemicals, although the extent of resistance may depend upon the length of time the chemical is in contact with the coating and to the quantity of chemical involved (a small spillage or splash may evaporate quickly, whereas a large pool will remain). Testing has been carried out, based on ASTM D1308, with the following results:

Chemical	Result	
	Splashing	Large spillage
Acetic acid	Not resistant	
Ammonium hydroxide (5 – 20%)	Resistant	
Ammonium nitrate (30%)	Resistant	
Ammonium sulphate (10%)	Resistant	
Butyl acetate	Resistant	Discolors on prolonged exposure
Chloroform	Discolors	Not resistant
Corn oil	Resistant	
Ethanol (95%)	Resistant	Not resistant
Hydrochloric acid (10%)	Discolors. Will cause failure if exposure > one hour.	
Linseed oil	Resistant	
Methanol	Not resistant	
Methoxy propanol	Resistant	Resistant for short exposure times
Methyl Ethyl Ketone (MEK)	Not resistant	
Morpholine	Resistant	Not resistant
Nitric acid	Not resistant	
Oxalic acid (5%)	Resistant	Resistant for short exposure times
Potassium permanganate	Discolors	
Pyridine	Not resistant	
Skydrol	Resistant	Resistant for short exposure times
Sodium chloride solution	Resistant	
Sodium hydroxide (5 – 20%)	Resistant	
Sodium hypochlorite (5%)	Resistant but discolors if exposure > 1 hour	
Sulphuric acid (5 – 20%)	Resistant but may discolor	
Sulphuric acid (>20%)	Not resistant	
Tricresyl phosphate	Resistant	
Trisodium phosphate	Resistant	
Unleaded gasoline	Resistant	Discolors if exposure > 1 hour
Urea (10 – 50%)	Resistant	
Water	Resistant	
White spirit	Resistant	
Xylene	Resistant	

Note: Maximum exposure time tested = 16 hours. Spillages should be cleaned up as soon as possible.

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16. Limitations & Cautionary Notes

In addition to cosmetic limitations detailed in the previous section, the following cautionary notes should be considered when using Intergard 740:

Intergard 740 is not intended for use on vessel areas subject to permanent immersion.

As stated in the previous section, when exposed to sunlight, Intergard 740 has poorer gloss and colour retention than other generic types of cosmetic finish.

It should be noted that applying the same shade of two different products side by side may not result in an exact colour match in practical situations. For example, application of Interbond 201 on the deck, Intergard 740 on topsides and Interlac 665 on superstructure, all in the same shade, can result in significant visual shade variations. This is due to the level of gloss and to the coating's reaction to exposure. Vessel operators should be made aware that such variations may exist.

Intergard 740 is susceptible to discoloration when subjected to high temperatures. For this reason, it is not recommended for use in vessel areas such as engine rooms, where high temperatures are unavoidable.

17. Approvals / Certification

When applied over Intergard 400 as part of an approved scheme, Intergard 740 holds the following approvals:

- Food Contact: Carriage of Grain (NOHA)
- Fire Resistance: Surface Spread of Flame (WFR) - (IMO Resolution A653 (16))
- Approved by Lloyd's Register as complying with the Marine equipment Directive (MED) requirements

Note: As detailed in section 3, IPK manufacture a modified variant of Intergard 740. For this reason, the Surface Spread of Flame test and subsequent MED approval cover IPK manufactured Intergard 740 only. Conversely, the Carriage of Grain test report relates to Intergard 740 manufactured in all locations except IPK.

Copies of approvals/certificates are available from the Marine Intranet site.

For offshore applications, when applied over Interzone 954, Intergard 740 is approved to Norsok M-501 Rev 3, System No.4 – Walkways & Escape routes.

The information in this document is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this document without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this document or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. Therefore, unless we specifically agree in writing to do so, we do not accept any liability at all for the performance of the product or for (subject to the maximum extent permitted by law) any loss or damage arising out of the use of the product. We hereby disclaim any warranties or representations, express or implied, by operation of law or otherwise, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose. All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this document is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local International Paint representative that this document is current prior to using the product.

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