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# KING-GUARD FLEX® INT-FR

## Spray Elastomeric Polyurea



### Heavy Duty—Intumescent Fire Retardant Coating System

#### KING-GUARD FLEX® INT-FR

**A 100% solids, fast-set, high performance, flame resistant spray polyurea elastomer coating.**

## Product Description

**KING-GUARD FLEX® INT-FR** is an intumescent, flame resistant, zero VOC, high performance spray-applied polyurea elastomeric coating and lining system, offering a high degree of mechanical and chemical protection for concrete, asphalt and steel surfaces in aggressive containment environments. Other uses include durable surface protective coatings applications for metal, concrete or wood structures.

**KING-GUARD FLEX® INT-FR** is a fast set system which allows “rapid return to service”. It is intended for use with heated plural component spray equipment with a mix ratio of 1:1. Typical application thickness is 2 - 4 mm.

**KING-GUARD FLEX® INT-FR** is applied using a plural component heated spray system. This product can be applied in temperatures ranging from -10°C to 50°C and can be utilised within 30 minutes (light duty traffic / water immersion).

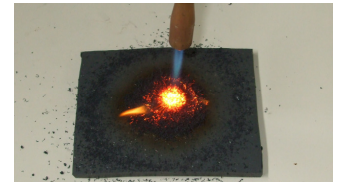
**KING-GUARD FLEX® INT-FR** meets the following tests for fire, smoke toxicity and friction:

*Standard test method for Critical Radiant Flux on Floor Covering Systems using Radiant Heat Energy Source (ASTM E-648)*

*Standard method of test for Surface Flammability of Materials using a Radiant Heat Energy Source (ASTM E162)*

*Standard test method for Surface Burning Characteristics of Materials (ASTM E84-05)*

*Standard method for Specific Optical Density of Smoke Generated by Solid Materials (ASTM E-662)*



## Advantages

Advantages of sprayed King Guard Flex® INT-FR coating include:

- Flame resistance
- Fast cure
- Excellent abrasion, traffic & impact resistance
- Resistant to cracking under high flex conditions - seamless
- Resistant to diesel fuel, weak acids and a wide range of chemicals

## Recommended Uses

**King-Guard Flex® INT-FR** is recommended as a durable, high performance fire retardant protective coating and lining system in a wide range of industries. Suitable applications may include:

- Offshore & onshore gas production facilities
- Oil platforms & FPSO's
- Structural steel protection
- Offshore accommodation module protection
- Flammable liquid secondary containment linings
- Earthen diesel fuel bund linings
- Tunnel fire protection
- Resilient 'flexibilised' flooring – Passenger trains



## Intumescent Fire Retardant - General Information & Fire Test Results

Development of an Intumescent Spray Polyurea that offers fire protection in addition to chemical resistance began in early 2005. Spray Polyureas are now more commonly used as secondary containment liners because of their seamless application and durability benefits.

In flammable liquid secondary containment applications the Intumescent Polyurea does not require covering with sand for fire protection. This feature minimizes disposal issues due to contaminated sand after a spill. Another important benefit is the ability to securely bond or adhere the spray applied liner to prepared storage tank concrete ring-beams, pipe supports plinths and other coated steel pipe penetrations, maximizing the leak proof capacity of the containment system.

<b>Critical Heat Flux of Floor Covering Systems ASTM E-648 (130 mil on steel plate)</b>	
Maximum Burn Length (inches)	5.93
Average Critical Radiant Flux (W/cm <sup>2</sup> )	0.97+

<b>Heat and Visible Smoke Release Rates ASTM E-1354 (50 KW heat flux)</b>	
Time to sustained flame (sec)	13
Peak heat release rate (kW/m <sup>2</sup> )	97.48
Average heat release rate for 300 sec (kW/m <sup>2</sup> )	39.75
Smoke average specific ext. area (m <sup>2</sup> /kg)	65.13

<b>Specific Optical Density of Smoke Developed ASTM E-662 (130 mil on steel plate)</b>		
Dm (average)	Non-flaming	173
Dm (average)	Flaming	249

<b>Amount of Toxic Gas Generation BSS 7239 Analysis after 4 minute exposure to 2.5 W/cm<sup>2</sup> and in flaming mode</b>		
ppm CO	Non-flaming	5
	Flaming	130
ppm HCN	Non-flaming	0.75
	Flaming	8
ppm HCL	Non-flaming	10
	Flaming	9.5
ppm HF	Non-flaming	<0.5
	Flaming	<0.5
ppm SO	Non-flaming	<1.0
	Flaming	<1.0
ppm NO	Non-flaming	<2.0
	Flaming	20

<b>Surface Burning Characteristics ASTM E84-05 (60 mil on cement board)</b>	
Flame Spread Classification	20
Smoke Developed Classification	115

## Chemical Resistance (7 Days Immersion Exposure - Guide Only)

Hydrochloric Acid 10%:	Resistant	Heavy Duty Detergent:	Resistant
Sulphuric Acid 20%:	Resistant	Sodium Chloride (all conc.) 60°C:	Resistant
Phosphoric Acid :	Resistant	Water, de-ionized:	Resistant
Sodium Hydroxide 20%:	Resistant, discolouration	Liquid Nitrogen Fertilizer:	Resistant
Sodium Hydroxide 50%:	Secondary containment only	Hydrogen Sulphide Gas:	Resistant
Diesel Fuel:	Resistant		

## Physical Properties *A cured membrane sample spray applied to a thickness of 2.5 - 3.0mm meets the following:-*

Gel Time	3 seconds
Tack Free Time	< 15 seconds
Light duty foot traffic	< 0.5 hours
90% Cure @ 25°C	24 hours
Tensile Strength, ASTM D-412	600 - 1000 psi
Tensile Elongation, %	100
Shore Hardness, D	45 - 50
Density [kg/litre]	1.14
Taber Abrasion Resistance, ASTM D-4060	250mg.wt.loss

## Surface Preparation

### Concrete

Concrete, asphalt and masonry surfaces to be high pressure water or sweep abrasive blasted to remove all traces of dirt, laitance and other contamination. Prime and fill imperfections in the substrate surface to limit out-gassing.

Remove all existing coatings by most efficient method available. Only well bonded, profiled, compatible coatings may remain. Vacuum to remove loose dust etc, prior to application of primers.

### Earthen Bund Linings over Geotextiles (fuel containment)

For flammable liquid secondary containment bund lining applications, consult Asset Systems for job specific installation details. It is possible to securely terminate the seamless spray lining onto prepared tank bases, plinths, pipes & penetrations.

### Carbon Steel

Steel substrate surfaces to be abrasive blasted to AS 1627.4 Class 2.5 - 3 and adequately profiled (consult Asset Systems). Avoid flash rusting prior to priming.

Soluble salts must be removed to an acceptable level for the coating/lining application.

### Primers

An adhesion promoting primer system is required for both metal and concrete substrates. Consult Asset Systems for advice.

## Application

The *King Guard Flex® INT-FR* is applied using specialist 1:1 plural component, heated, high pressure spray equipment. Specific material mixing, material processing and spray application

## Cure Time

Applications in cold temperatures will require longer cure times. For rapid return to service applications, consult Asset Systems for advice.

	10 - 21°C	21 - 32°C	32 - 43°C
<b>Tack Free</b>	<30 sec	<30 sec	<30 sec
<b>Hard Film</b>	<2 min	<2 min	<2 min
<b>Recoat (max)</b>	5 hr	5hr	5hr
<b>Light Foot Traffic</b>	15 min	15 min	15 min
<b>Water Immersion</b>	30 min	30 min	30 min
<b>Full Cure</b>	4 days	3 days	2 days

Consult Asset Systems for specific over-coating instructions. Surfaces may require additional preparation/priming.

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