



BORYGO RUNWAY KF

RUNWAY DEICING FLUID

TECHNICAL DATA SHEET

(SAE AMS 1435 C)

BORYSZEW S.A. ODDZIAŁ BORYSZEW ERG W SOCHACZEWIE

Product Description

Borygo Runway KF is a technologically advanced and effective runway deicing fluid based on a potassium formate solution. It can be applied to runways, taxiways, aprons and it contains a corrosion inhibitor system protecting elements made from metals and alloys used in the aviation industry. The active ingredient content is no less than 50 %.

Borygo Runway KF is a clear, colorless and environment friendly fluid. It does not contain glycols, urea, triazole, nitrates and surfactants based on alkyphenols.

Physical Properties

Property	SAE AMS 1435 C requirement	Borygo Runway KF Typical Value
Chemical Composition	50% potassium formate solution containing a corrosion inhibitor system	
Appearance	Clear and homogeneous fluid, uniform in color, free from skins, lumps and foreign materials	
Color	Colorless	
Flash Point	Not lower than 100 °C (ASTM D56 or ASTM D93)	Conforms (No flash to 100 °C)
Specific Gravity	Preproduction value \pm 0,015 (ASTM D 891)	1,354 @ 15,6 °C (@ 60° F) 1,34 – 1,35 g/cm³ @ 20 °C
pH	Preproduction value \pm 0,5 (ASTM E70)	10,7
Freezing Point	Lower than - 14,5 °C Preproduction value \pm 4°C (ASTM D 1177)	- 15 °C @ 50 % dilution by weight - 60 °C (ready to use fluid)

Borygo Runway KF

Kinematic Viscosity	-	Max. 2,5 mm²/s @ 20 °C Max. 5 mm²/s @ - 10 °C
Rinsibility	Shall be completely rinsible in tap water	Conforms
Storage Stability	Shall not exhibit separation or an increase in turbidity (ASTM F 1105)	Conforms

Biodegradability & Ecological Behaviour

Property	SAE AMS 1435 C requirement	Borygo Runway KF Typical Value
BOD	APHA Standard Methods 5 days @ 20 °C	0,04 kg O₂/kg fluid
COD	APHA Standard Methods	0,11 kg O₂/kg fluid
Daphnid Acute Toxicity Test	EPA 40 & CFR 797.1300 48 hour LC ₅₀	1,225 mg/L
Fish Acute Toxicity Test	EPA 40 & CFR 797.1400 96 hour LC ₅₀	2,250 mg/L

Summary of Trace Contaminants Results

	SAE AMS 1435 C requirement	Borygo Runway KF Typical Value
Sulfur	Informational	< 0,0001 %
Halogens		0,0038 %
Phosphate (P as P ₂ O ₅)		0,0460 %
Nitrate (as NO ₃)		0,0002 %
Lead (Pb)		< 0,0001 %
Chromium (Cr)		0,0001 %
Cadmium (Cd)		<0,0001 %
Mercury (Hg)		0,0002 %

Material Compatibility

Aluminum alloys (Bare & Anodized)	Painted & Unpainted surfaces
Magnesium alloys (Dichromate treated)	Bitumen
Titanium alloy	Asphalt concrete (96 % adhesion value)
Carbon Steel	Cement concrete
Cadmium plated steel	Concrete (Rating = 1)
Acrylic plastic	Concrete fillers
Polycarbonate plastic	...
Acrylic paints	

Ice Penetration Test Results (SAE AIR6211)

Test Temperature - 10 °C (14° F)	
Time (minutes)	Penetration Depth (mm) Average
5	2,0 mm
10	2,0 mm
15	3,0 mm

Ice Melting Test Results (SAE AIR6170)

Test Temperature - 10 °C (14 °F)			
Time (minutes)	Mean Mass of Deicing / Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5,0	3,5	0,7
10	5,0	3,7	0,7
30	5,0	4,5	0,9

Test Temperature - 2 °C (28 °F)			
Time (minutes)	Mean Mass of Deicing / Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5,0	5,4	1,1
10	5,0	6,2	1,2
30	5,0	7,6	1,5

Ice Undercutting Test Results (SAE AIR6172)

Test Temperature - 10 °C (14 °F)				
Time (minutes)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm ²)	Area Original Cavity A_s (mm ²)	Ice Undercutting IU (mm ²)
5	7,0	38,4	7,1	31,3
10	7,7	46,6	7,1	39,5
30	8,0	50,3	7,1	43,2

Test Temperature - 2 °C (28 °F)				
Time (minutes)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm ²)	Area Original Cavity A_s (mm ²)	Ice Undercutting IU (mm ²)
5	9,4	69,4	7,1	62,3
10	10,6	88,2	7,1	81,1
30	11,6	105,7	7,1	98,6

Suggested Application Rates

Temp. (° C)	Dry Conditions Ice thickness <1mm Light frost		Wet conditions Ice thickness <1mm Heavy frost		Wet conditions Snow Packed snow		Wet conditions Freezing rain Ice Thickness 1-3 mm	
	Anti-icing	Deicing	Anti-icing	Deicing	Anti-icing	Deicing	Anti-icing	Deicing
0 to - 5	15g/m ²	20g/m ²	20g/m ²	25g/m ²	25g/m ²	30g/m ²	30g/m ²	35g/m ²
- 5 to - 10	20g/m ²	30g/m ²	30g/m ²	35g/m ²	35g/m ²	40g/m ²	40g/m ²	45g/m ²
- 10 to - 15	25g/m ²	40g/m ²	40g/m ²	45g/m ²	45g/m ²	50g/m ²	50g/m ²	50g/m ²

Note 1: Borygo Runway KF can be used both as a deicing and an anti-icing chemical.

Note 2: Borygo Runway KF is delivered ready to use. It should not be diluted or further concentrated.

Note 3: Borygo Runway KF can be applied using all known conventional spraying equipment. The amount of Borygo Runway KF must be adjusted according to the weather and runway conditions.

Note 4: In case of thick ice-layers (>3 mm), it is recommended to use Borygo Runway KF in combination with the solid deicer Borygo Runway SF/NW-058.

Note 5: In the case of deicing, the surface should be treated mechanically before applying Borygo Runway KF.

Packaging

Borygo Runway KF is available in 1000 l IBC containers or in bulk.

For other packaging types please feel free to contact Boryszew'S ERG Aerochemicals Dept.

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