

# Product Sheet

## RUNWAY DE-ICER

CLARIANT 

SAFEWAY®  
SF



### Product Description

Safeway® SF is an efficient solid de-icer for runways and aprons that meets or exceeds the current SAE AMS 1431 specification and conforms to strict ecological requirements.

Sodium formate, the basis of Safeway® SF, acts as a freezing point depressant and melts ice and snow rapidly. The specially designed composition of Safeway® SF ensures that the materials employed in aircraft construction are not attacked. The laboratory of Scientific Material International Inc., Miami approved Safeway® SF by conducting all tests required by to AMS 1431.

Safeway® SF was tested not only on paints and clear acrylic sheet but also on various metals to show its low corrosive effect; the sandwich corrosion test, a special aluminium corrosion test and the hydrogen embrittlement test were also conducted with positive results.

When used in conjunction with the spreading equipment of airport maintenance departments and modern dispersing techniques, Safeway® SF allows snow and ice to be cleared quickly and economically.

Safeway® SF is especially active in conjunction with liquid runway de-icers (e. g. Safeway® KF HOT or Safeway® KA HOT). Safeway® SF also gives long-term protection against ice and snow if preventive treatment of cleared areas or those not yet iced over is performed.

Due to its environmental benefits, Safeway® SF was awarded with the eco-label *The Blue Angel*.

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## Technical Data - Product Properties

	VALUE	REFERENCE METHOD
<b>PHYSICAL PARAMETERS</b>		
Appearance	White to slightly yellow granules	visual
Bulk Density	approx. 941 kg/cm <sup>3</sup>	DIN 53466
Melting Point	approx. 260 °C	OECD 102
pH value (50 g/L at 20 °C)	approx. 11.5	DIN 19268
<b>MATERIAL COMPATIBILITY</b>		
Transparent Plastic	passed	ASTM F 484
Painted Surfaces	passed	ASTM F 502
Unpainted Surfaces	passed	ASTM F 485
Runway Concrete Scaling Resistance	passed	ASTM C 672
Asphalt Concrete Degradation Resistance	passed	LFV Method 2-98
Sandwich Corrosion	passed	ASTM F 1110
Total Immersion Corrosion		
Al Alloy	passed	AMS 4037, 4041, 4049
Mg Alloy, dichromate treated	passed	AMS 4367
Ti Alloy	passed	AMS 4911
Carbon Steel	passed	AMS 5045
Low-Embrittling Cd Plate	passed	ASTM F 1111
Hydrogen Embrittlement	passed	ASTM F 519
Stress-Corrosion Resistance	passed	ASTM F 945 A
<b>ECOLOGY AND TOXICOLOGY</b>		
German regulations on dangerous substances	does not require a hazard warning label	(GefStoffV)
Water Hazard Class	1	(WGK)
Bacteria Toxicity (EC <sub>50</sub> , 16 h, <i>Pseudomonas putida</i> )	6,165 mg/L	DIN EN ISO 10712
Fish Toxicity (LC <sub>50</sub> , 96 h, zebra fish)	8,226 mg/L	OECD 203
Daphnia Toxicity (EC <sub>50</sub> , 48 h, <i>Daphnia magna</i> )	> 1,000 mg/L	OECD 202
Algae Toxicity (EC <sub>50</sub> , 72 h, <i>Desmodesmus sub.</i> )	> 1,000 mg/L	OECD 201
Biodegradability (28 d, 20°C)	93 %	OECD 301 B
Chemical Oxygen Demand (COD)	0.240 kg O <sub>2</sub> /kg	DIN 38409-H41
Biochemical Oxygen Demand (BOD <sub>5</sub> )	0.016 kg O <sub>2</sub> /kg	DIN 38409-H51

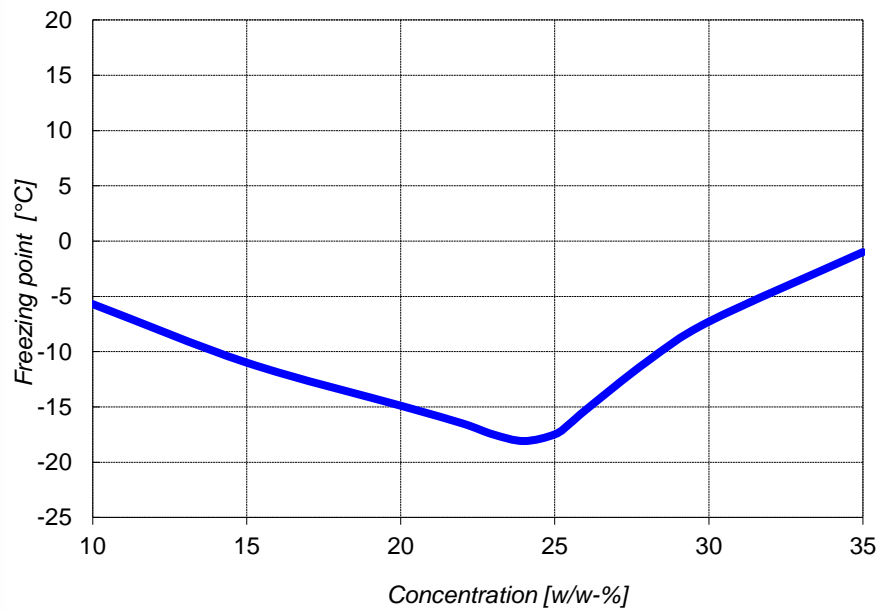
The results of the eco-toxicological tests demonstrate that Safeway® SF is toxicologically harmless and has a low COD value. Like acetates it is easily biodegradable. The use of Safeway® SF avoids nitrogen contamination of surface and ground water. Also, oxygen depletion of soil or surface waters or in the sewage treatment plant is reduced.

## Oxygen Demand and Nitrogen Content of Solid Runway De-icers:

<b>Safeway® SF</b>	0.24 kg O <sub>2</sub> /kg	0 kg N <sub>2</sub> /kg
<b>Urea</b>	2.10 kg O <sub>2</sub> /kg	0.482 kg N <sub>2</sub> /kg

## In Service Properties

### Freezing point, ASTM D 1177



## Application Recommendations

These following application recommendations indicate a rough idea of the applicable amounts in different de-/ anti-icing conditions. Depending on the weather situation and conditions of the runway the indicated application rates can be significantly different.

### De-Icing:

RUNWAY CONDITIONS	0 °C TO -5 °C	-5 °C TO -10 °C	LOWER THAN -10 °C
Ice, Packed Snow	10 - 20 g/m <sup>2</sup>	20 - 30 g/m <sup>2</sup>	30 - 40 g/m <sup>2</sup>
Snow, Snow fall	25 - 35 g/m <sup>2</sup>	35 - 45 g/m <sup>2</sup>	45 - 55 g/m <sup>2</sup>
Ice, Freezing Rain	30 - 40 g/m <sup>2</sup>	40 - 50 g/m <sup>2</sup>	50 - 60 g/m <sup>2</sup>

Common application together with liquid de-icer Safeway® KF HOT or Safeway® KA HOT is possible. This may increase efficiency of Safeway® SF.

### Anti-Icing:

WHEATHER CONDITIONS	APPLICATION RATE
Expectation of freezing rain or wet snow	20 - 30 g/m <sup>2</sup>

To increase efficiency pre-wetting with Safeway® KA HOT BLUE is recommended.

Safeway® SF is an efficient solid de-icer for runways and aprons. The efficiency of runway de-icers is influenced by many different factors like surface material, surface roughness, way of application, weather and wind conditions. Therefore the required amount may differ from the recommended amounts.

Application of Safeway® SF is distinguished between de-icing and anti-icing. De-icing means the melting of ice and snow by the application of Safeway® SF followed by mechanical removal of the slush. Anti-icing means the preventive application of Safeway® SF in order to protect the runway when icing conditions like freezing rain or snow are expected.

In order to use as little of a de-icing chemical as possible generally it makes sense to apply the de-icing chemical in an anti-icing manner as short before the expected precipitation as possible.

In order to reduce the necessary amount of Safeway® SF it should only be used to dissolve the ice layer from concrete or asphalt surface. Ice and snow which does not stick to the surface should be removed by snow ploughs and sweeper blowers.

## Delivery and Storage

Safeway® SF is despatched in 25 kg bags, 500 kg and 1000 kg big bags.  
In order to avoid sticking of Safeway® SF grains, it is recommended to store in a dry place.

## Equipment

Safeway® SF can be spread by conventional equipment, which is used to spread solid de-icers like sand, rock salt or urea. In general spreaders based on a rota-ting plate which are able to spread liquid as well as solid de-icers can be used. Taking into consideration shipping weight of Safeway® SF the applicable amount per area unit has to be adjusted according to the recommendation of the respective spreading truck.

Based on environmental aspects it is reasonable to keep the amount of de-icer as low as possible. Therefore, we would like to refer to the recommendations of the “*Arbeitsgemeinschaft Deutscher Flughäfen (ADV)*” and to the bulletin “*Enteisungsabwasser von Flugplätzen*“ of the working group deicing waste water as well.

Safeway® SF is in line with all therein stated recommendations.

Due to its outstanding environmental benefits and ice melting performance Safeway® SF was awarded to the well-known eco label **The Blue Angel**.



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