



TEST REPORT

VTI No.: 23-068-2

Client

NORDIX CHEMICALS FACTORY d.o.o.

Maja Katić

Radnička cesta 173L

10000, Zagreb

CROATIA

Commission

Laboratory analysis

Test material

De-icing agent

Date of sample arrival

2023-11-13

Test period

2023 11-22 – 2024-02-01

Marking of sample

D-ICE NF

Test material

The test material consists of D-ICE NF solid runway de-icing agent.

Analysis

Asphalt Concrete Degradation Resistance has been tested according to LFV Method 2-98 as specified in Appendix A (and in EN 12697-41:2023) and § 3.2.8.2 of the SAE Aerospace Material Specification AMS1431E, revised 10/2018.

Result

The reduction in adhesion value was 9% * for asphalt concrete specimens stored in the concentrated (regular highest concentration) solution of the solid de-icing agent D-ICE NF compared to the dry reference specimens. Detailed information on the test results is given in Appendix 1 of this report.

The pH value of the concentrated solution was 12,5 # and the density at 20 °C was 1,320 g/cm³.

*The adhesion value for specimens stored in the concentrated solution shall not be reduced by more than 50% compared to the dry reference specimens to meet the requirement of the specification AMS1431E.

The reported pH value is for indicative purposes only, and its measurement uncertainty is undetermined.

Test report issued by

2024-02-02

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Jiqing Zhu

Senior Researcher

Signerat av: Jiqing Zhu

Reviewed by

2024-02-02

X

Björn Kalman

Research Director

Signerat av: Björn Kalman

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Appendix 1

Effect on asphalt concrete of the runway de-icing agent according to AMS1431E, Appendix A (LFV Method 2-98) for the solid de-icing product.

The test has been performed on dense asphalt concrete (ABT16) with a 16 mm maximum size of the aggregate. The aggregate, a granite, came from the Skärlunda quarry, located outside Norrköping, Sweden. The asphalt concrete was made with paving grade bitumen 160/220 manufactured of crude oil from Venezuela. Binder content was 5,7 % by mass. The air voids content was 7%±1% by volume. The samples were stored in the concentrated (regular highest concentration) solution of the solid de-icing agent for 70 days at 40 °C and the tensile tests were performed at 23 °C.

Runway de-icing product D-ICE NF

The unit for the surface tensile strength is MPa in the tables below.

Surface tensile strength, dry samples		Type of failure (adhesion between the epoxy resin and the asphalt concrete in %)		Mean value and standard deviation of surface tensile strengths (dry samples)	Density, dry samples. (g/cm ³)		Mean value of density, dry samples (g/cm ³)	Mean value of air voids, dry samples (%)
0,985	1,125	100	100	1,08 ± 0,22	2,247	2,248	2,248	7,1
1,046	1,165	100	100		2,248	2,248		

Surface tensile strength, wet samples		Type of failure (adhesion between the epoxy resin and the asphalt concrete in %)		Mean value and standard deviation of surface tensile strengths (wet samples)	Density, wet samples. (g/cm ³)		Mean value of density, wet samples (g/cm ³)	Mean value of air voids, wet samples (%)
0,996	0,957	100	100	0,99 ± 0,22	2,250	2,251	2,251	7,0
0,948	1,045	100	100		2,251	2,252		

The expanded uncertainty is the product of the reproducibility standard deviation σ_R , and the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The reproducibility standard deviation determined in interlaboratory comparisons and are indirectly specified in the method $2 \sigma_R = R / 2^{0.5}$.

The reduction in surface tensile strength of the wet samples compared to the dry samples is: **9%.**

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