

TEST REPORT

VTI No.: 24-065-1

Client

NORDIX CHEMICALS FACTORY d.o.o.

Maja Katić

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10000, Zagreb

CROATIA

Commission

Laboratory analysis

Test material

De-icing agent

Date of sample arrival

2024-10-03

Test period

2024-10-10 – 2024-12-20

Marking of sample

D-ICE KA

Test material*The test material consists of D-ICE KA liquid 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 § 3.2.10.2 of the SAE Aerospace Material Specification AMS1435E, revised 03/2024.

Result

The reduction in adhesion value was 18% * for asphalt concrete specimens stored in the liquid de-icing agent D-ICE KA 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 liquid de-icing agent was 11,5 # and the density at 20 °C was 1,275 g/cm³.

*The adhesion value for specimens stored in the liquid de-icing agent shall not be reduced by more than 50% compared to the dry reference specimens to meet the requirement of the specification AMS1435E.

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

Report issued by

2024-12-20

X 

Jiqing Zhu

Senior Researcher

Signed by: Jiqing Zhu

Reviewed by

2024-12-20

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Appendix 1

Effect on asphalt concrete of the runway de-icing agent according to AMS1435E, Appendix A (LFV Method 2-98) for the liquid 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 liquid de-icing agent for 70 days at 40 °C and the tensile tests were performed at 23 °C.

Runway de-icing product D-ICE KA

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 (%)
0,988	1,031	100	100	0,99 ± 0,22	2,251	2,256	2,255	6,8
0,995	0,958	100	80		2,256	2,258		

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 (%)
0,804	0,856	100	100	0,81 ± 0,22	2,249	2,252	2,252	6,9
0,781	0,807	100	100		2,253	2,253		

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 is determined in inter-laboratory comparisons and is 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: **18%.**

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