

# **Durability Problems on Nordic Airfields- The Influence of Deicing Agents on Asphalt Concrete**



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# Background R&D-project

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Observed degradation of asphalt pavement at:

- Gothenburg-Landvetter Airport
- Sundsvall Airport
- Oslo-Fornebu Airport
- Oslo-Gardermoen Airport

# Background R&D-project

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- Disintegration of pavement, loose stones
- Softening and stripping effects on bitumen and asphalt concrete
- The wearing course of the asphalt pavement growing old faster

# Background R&D-project

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- Soft bitumen caused dirt spray on runway markings and lightings
- Problems occurred when changing from urea to acetate
- Nitrogen problems with urea
- Over-fertilisation of soil and watercourses around airports

# R&D deicing project

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- A Norwegian/Swedish joint project started 1998 to solve the problems
- Carried out by Norwegian and Swedish CAA
- Later on Finnish CAA joined the project
- Co-operation with several research institutes and deicing agent manufacturers

# R&D deicing project contents

H<sub>2</sub>O

KF

KA2

KA2/GM

LIREA

- Full-scale experiments
- Laboratory investigations
- Weather simulator test

# R&D deicing project results

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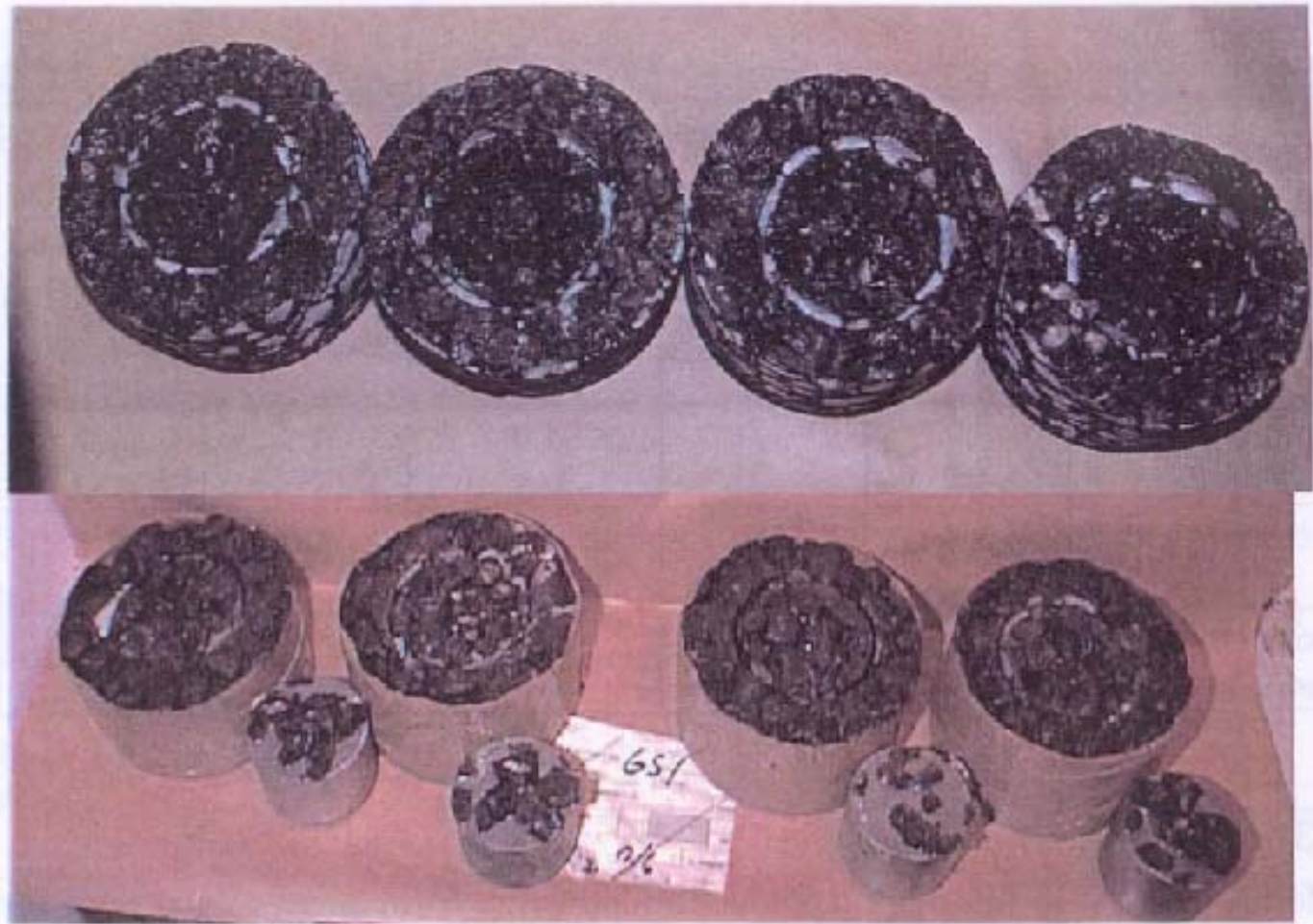
- Requirement specifications for runway and aircraft deicers
- Requirements of deicing agent influence on asphalt and bitumen
- Development of LFV Method 2-98
- Standardization work in SAE G-12 Fluids Subcommittee

# LFV Method 2-98

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- Determining adhesion of asphalt concrete after storage in deicing agent
- 70 days storage in 40°C
- Comparison with adhesion value of specimens not stored in deicing agent

# LFV Method 2-98



# LFV Method 2-98



# R&D deicing project results

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- Melting capacity requirements to get an effective deicing agent, decrease fluid consumption
- Environmental and working environmental requirements

# Nordic co-operation

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- Co-operation between Norwegian, Swedish and Finnish CAA
- Round robin test of LFV Method 2-98

# Round robin test

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- Precision data according to SS-ISO 5725, ASTM E691 and ASTM C802
- Reliable and well defined test method
- Repeatability (within a laboratory) and reproducibility (between participating laboratories) of the method well defined

# LFV Method 2-98

European standard method within CEN  
(European Committee for standardization)  
named EN 12697-43

# Nordic co-operation

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- Introduce international requirements in SAE AMS 1431 and 1435
- Using joint requirement specifications in connection with purchasing of deicing fluids
- Co-ordination of environmental requirements

# LFV Method 2-98

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LFV Method 2-98 is used as a technical criteria in connection with purchasing of

- aircraft and runway deicers
- asphalt pavements and
- bitumen



# Nordic co-operation

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- General agreements for deicers and bitumen
- In connection with purchasing of asphalt pavements and bitumen the deicers at the actual airport are used in the test

# R&D deicing project

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Requirements is necessary to guarantee

- High flight safety
- and improve
- Regularity
  - Environment and
  - Economy for airfield operators

# Contact

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