

Annual Report
Aircraft Deicing
Winter Season 2024/2025 at Munich Airport



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1. Capacities

For deicing only EFM employees have been deployed.
26 deicing vehicles were available.

2. Deicing operations

During the 2024–2025 winter season (October through April), EFM deiced a total of 6,937 aircraft, compared to a planned figure of 6,797 and 4,942 in the previous year.

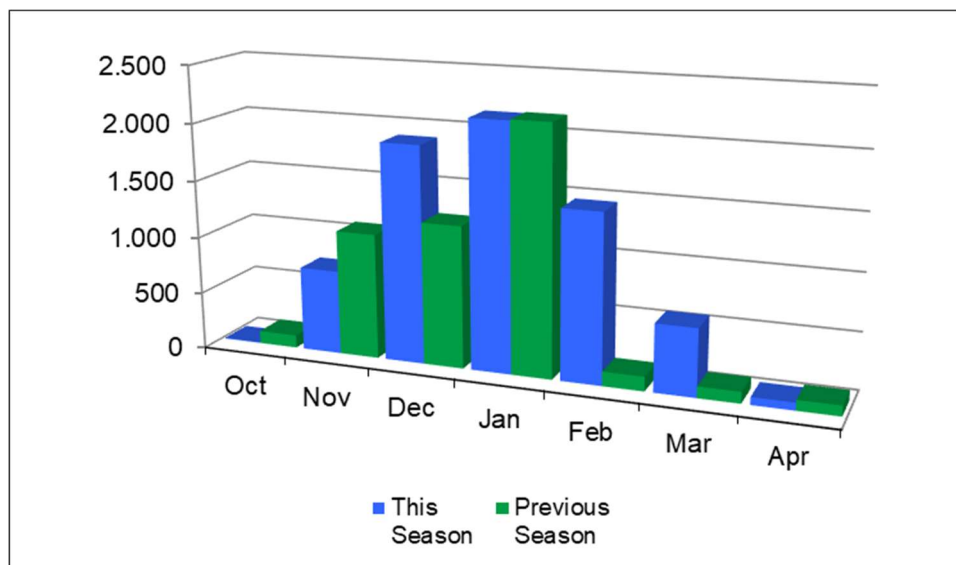
EFM's deicing teams were deployed on 156 out of 212 days throughout the season. The busiest day was February 16, 2025, with 252 deicing operations.

Due to precipitation, anti-icing with ADF Type IV (>10,000 liters) had to be performed on 17 days (previous year: 14). A two-step procedure was used in 26% of all deicing operations, compared to 31% in the previous season.

Table 1: Deicing per month

Month	This Season	Previous Season
Oct	6	111
Nov	739	1.099
Dec	1.903	1.245
Jan	2.159	2.168
Feb	1.473	127
Mar	590	101
Apr	67	91
Total	6.937	4.942

Diagram 1: Deicing treatments per month

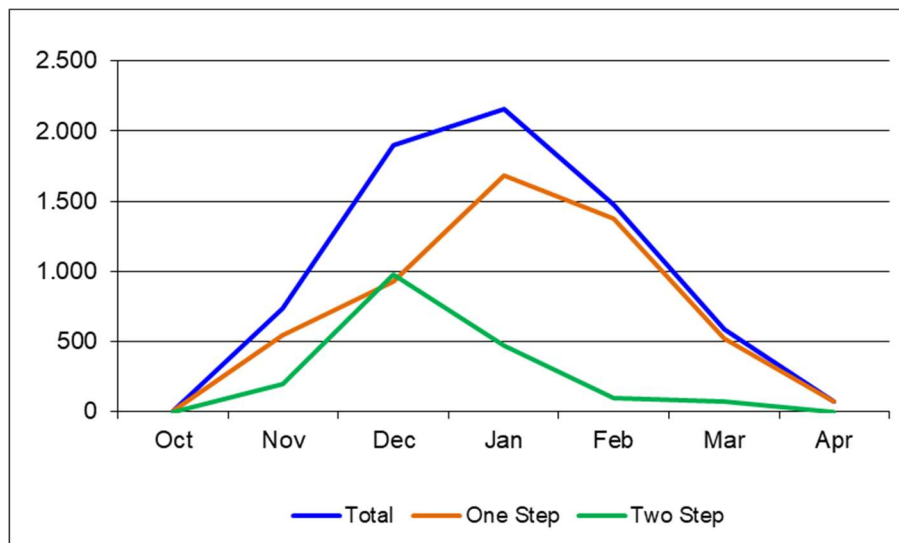


Out of the total 6,937 de-icing operations (including repeated treatments), 6,881 were carried out at the remote de-icing areas near the runway heads, representing 99.2%, while only 56 operations (0.8%) took place on the apron.

Based on data from previous seasons, a de-icing rate of 12% was projected for all departures of our COLD contract partners during the winter schedule. For non-COLD customers, a 7% probability was anticipated.

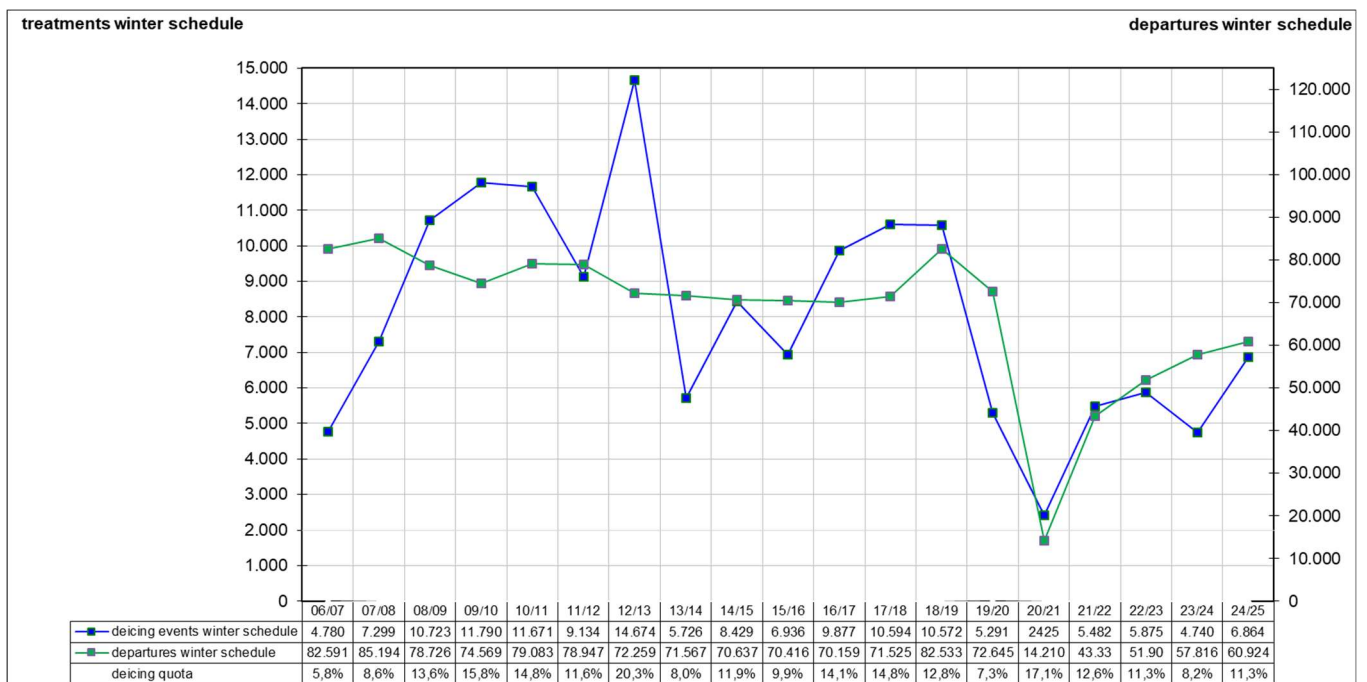
The actual results show a de-icing rate of 12.4% for COLD partners and 5.6% for non-COLD customers. Over the course of the entire winter season, the overall de-icing rate for all commercial flights was 11.3%, compared to 8.2% in the previous season.

Diagram 2: Development of deicing treatments



The diagram below shows deicing numbers as of the last years during the winter schedule.

Diagram 3: Number of departures and deicing treatment



3. Consumption of deicing fluid

The total consumption of ADF Type I Mix during the 2024–2025 winter season amounted to 3,041 cubic meters, down from 3,598 cubic meters in the previous season. In comparison, 535 cubic meters of ADF Type IV were used, slightly up from 509 cubic meters last year.

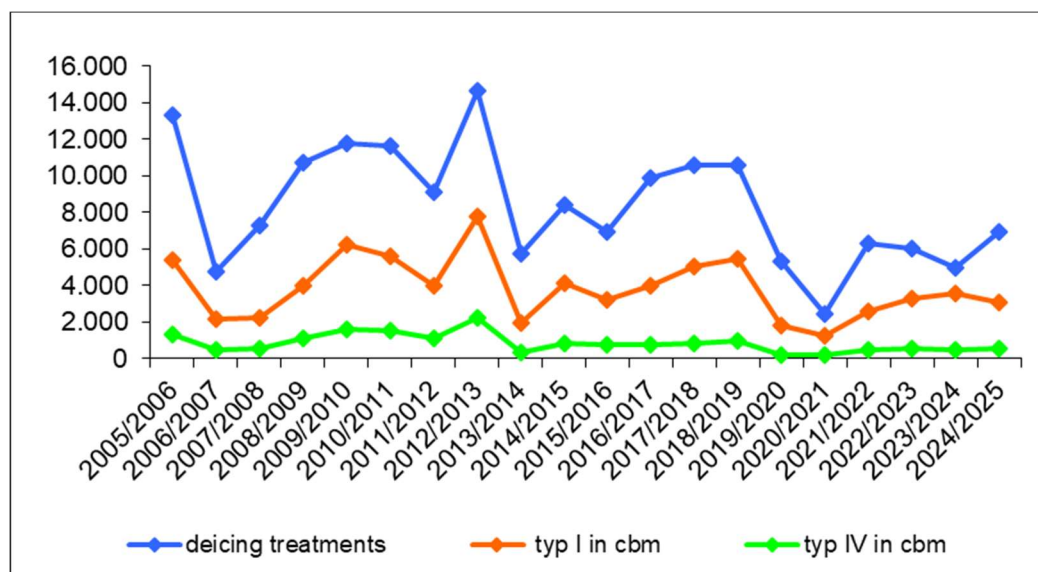
Of the 3,041 cubic meters of ADF Type I Mix consumed, 1,726 cubic meters were made from recycled material, meaning that 57% of the total Type I fluid usage was supplied by recycled fluids.

The average consumption per de-icing treatment was 438 liters of ADF Type I Mix (previous season: 728 liters) and 295 liters of ADF Type IV for two-step procedures (previous season: 334 liters). With regard to total fluid consumption, the share of ADF Type IV increased slightly to 15.0%, compared to 12.4% in the previous season.

Table 1: De-icing treatments und average consumption per aircraft category

Aircraft cat.	Treatments total		Treatments 2-Step		ADF Typ I (liters/treatments total)		ADF Typ IV (liters/2-step treatments)	
	2023/2024	2024/2025	2023/2024	2024/2025	2023/2024	2024/2025	2023/2024	2024/2025
0	56	63	15	18	391	241	141	167
1	686	646	219	194	404	261	172	157
2	3.543	5.373	1.079	1.395	604	362	279	253
3	73	74	30	23	1.291	723	515	493
4	584	781	182	183	1.822	1.102	837	755
Total	4.942	6.937	1.525	1.813	728	438	334	295

Diagram 4: deicing events and fluid consumption of the last years



4. Outlook for next winter season

EFM currently sees no fundamental changes in service delivery. Despite significant seasonal fluctuations, there are no identifiable direct impacts of climate change on the average deicing rate. However, it is becoming increasingly evident that EFM's operations are influenced less by continuous winter weather patterns and more by short-term extreme weather events.

To remain reliably operational even under challenging weather conditions, EFM continues to invest in state-of-the-art de-icing technology. For the 2025/2026 winter season, a total of 26 de-icing vehicles will be in operation, including eight units featuring the latest technology, enabling deicing procedures to be carried out entirely electrically. Regarding deicing fluid we continue to rely on our supplier Clariant.

5. Explanations

ADF	Aircraft deicing fluid												
ADF Type I	Aircraft deicing fluid Clariant Safewing MP I LFD (80 % glycol, 20 % water). EFM uses ADF Type I in a mixture of 55/45 (Type I/water) which means a proportion of 44 % glycol and 56 % water.												
ADF Type IV	Aircraft deicing fluid Clariant Safewing MP IV LAUNCH. EFM uses Type IV only pure and only as anti-icing fluid (to protect the aircraft against new icing).												
Aircraft categories	<table border="1"> <thead> <tr> <th>A/C cat.</th><th>MTOW (= Max. take-off weight, metric tons)</th></tr> </thead> <tbody> <tr> <td>0</td><td>General aviation aircraft</td></tr> <tr> <td>1</td><td>< 25</td></tr> <tr> <td>2</td><td>25 < 100</td></tr> <tr> <td>3</td><td>100 < 200</td></tr> <tr> <td>4</td><td>> 200</td></tr> </tbody> </table>	A/C cat.	MTOW (= Max. take-off weight, metric tons)	0	General aviation aircraft	1	< 25	2	25 < 100	3	100 < 200	4	> 200
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COLD partner	Deicing of customers who have a COLD contract with EFM. COLD customers pay a flat fee per season for de-icing and a small sum for each de-icing treatment.												
Non-COLD customer	Deicing of customers who do not have a COLD contract with EFM. They do not pay a flat fee but higher prices for each de-icing treatment than COLD partners.												
Remote areas	Special areas near the ends of the runways which are used only for de-icing and as entries to the runways. ADF, which is used on these areas, can be collected and recycled.												
Two-step procedure	Two-step de-icing. The first step (the actual de-icing) removes ice, snow etc. from the aircraft. In the second step (anti-icing), the aircraft is re-sprayed, either with Type I de-icing fluid or with Type IV fluid to protect the relevant surfaces against fresh accumulations.												

Note: Minor differences in the tables result from rounding differences.